

SEQUENCE LISTING



#3

<110> Shimkets, Richard  
Fernandes, Elma  
Vernet, Corine  
Yang, Meijia  
Boldog, Ferenc  
Herrmann, John

<120> Novel Nucleic Acid Sequences Encoding Human Semaphorin-Like Polypeptides

<130> 15966-554 Cura-54 CON-S14

<140> 10/002,050

<141> 2001-11-02

<150> 09/604,286

<151> 2000-06-22

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<170> PatentIn Ver. 2.0

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Trp Thr Met Arg Leu Val Thr Ala Ala Leu Leu Leu Gly Leu Met Met

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gtg gtc act gga gac gag gat gag aac agc ccg tgt gcc cat gag gcc 214

Val Val Thr Gly Asp Glu Asp Glu Asn Ser Pro Cys Ala His Glu Ala

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ctc ttg gac gag gac acc ctc ttt tgc cag ggc ctt gaa gtt ttc tac 262

Leu Leu Asp Glu Asp Thr Leu Phe Cys Gln Gly Leu Glu Val Phe Tyr

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cca gag ttg ggg aac att ggc tgc aag gtt gtt cct gat tgt aac aac 310

Pro Glu Leu Gly Asn Ile Gly Cys Lys Val Val Pro Asp Cys Asn Asn

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| Tyr Arg Gln Lys Ile Thr Ser Trp Met Glu Pro Ile Val Lys Phe Pro   |     |
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| ggg gcc gtg gac ggc gca acc tat atc ctg gtg atg gtg gat cca gat   | 406 |
| Gly Ala Val Asp Gly Ala Thr Tyr Ile Leu Val Met Val Asp Pro Asp   |     |
| 85 90 95  |     |
| gcc cct agc aga gca gaa ccc aga cag aga ttc tgg aga cat tgg ctg   | 454 |
| Ala Pro Ser Arg Ala Glu Pro Arg Gln Arg Phe Trp Arg His Trp Leu   |     |
| 100 105 110   |     |
| gta aca gat atc aag ggc gcc gac ctg aag gaa ggg aag att cag ggc   | 502 |
| Val Thr Asp Ile Lys Gly Ala Asp Leu Lys Glu Gly Lys Ile Gln Gly   |     |
| 115 120 125 130   |     |
| cag gag tta tca gcc tac cag gct ccc tcc cca ccg gca cac agt ggc   | 550 |
| Gln Glu Leu Ser Ala Tyr Gln Ala Pro Ser Pro Pro Ala His Ser Gly   |     |
| 135 140 145   |     |
| ttc cat cgc tac cag ttc ttt gtc tat ctt cag gaa gga aaa gtc atc   | 598 |
| Phe His Arg Tyr Gln Phe Phe Val Tyr Leu Gln Glu Gly Lys Val Ile   |     |
| 150 155 160   |     |
| tct ctc ctt ccc aag gaa aac aaa act cga ggc tct tgg aaa atg gac   | 646 |
| Ser Leu Leu Pro Lys Glu Asn Lys Thr Arg Gly Ser Trp Lys Met Asp   |     |
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| aga ttt ctg aac cgt ttc cac ctg ggc gaa cct gaa gca agc acc cag   | 694 |
| Arg Phe Leu Asn Arg Phe His Leu Gly Glu Pro Glu Ala Ser Thr Gln   |     |
| 180 185 190   |     |
| ttc atg acc cag aac tac cag gac tca cca acc ctc cag gct ccc aga   | 742 |
| Phe Met Thr Gln Asn Tyr Gln Asp Ser Pro Thr Leu Gln Ala Pro Arg   |     |
| 195 200 205 210   |     |
| gaa agg gcc agc gag ccc aag cac aaa aac cag gcg gag ata gct gcc   | 790 |
| Glu Arg Ala Ser Glu Pro Lys His Lys Asn Gln Ala Glu Ile Ala Ala   |     |
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| tgc tagatagccg gctttgccat ccgggcatgt ggccacactg cccaccaccg        | 843 |
| Cys   |     |
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 Glu Ala Leu Leu Asp Glu Asp Thr Leu Phe Cys Gln Gly Leu Glu Val  
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 Phe Tyr Pro Glu Leu Gly Asn Ile Gly Cys Lys Val Val Pro Asp Cys  
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 Asn Asn Tyr Arg Gln Lys Ile Thr Ser Trp Met Glu Pro Ile Val Lys  
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 Pro Asp Ala Pro Ser Arg Ala Glu Pro Arg Gln Arg Phe Trp Arg His  
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 Trp Leu Val Thr Asp Ile Lys Gly Ala Asp Leu Lys Glu Gly Lys Ile  
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 Gln Gly Gln Glu Leu Ser Ala Tyr Gln Ala Pro Ser Pro Pro Ala His  
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 Ser Gly Phe His Arg Tyr Gln Phe Phe Val Tyr Leu Gln Glu Gly Lys  
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 Val Ile Ser Leu Leu Pro Lys Glu Asn Lys Thr Arg Gly Ser Trp Lys  
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 Met Asp Arg Phe Leu Asn Arg Phe His Leu Gly Glu Pro Glu Ala Ser  
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 Thr Gln Phe Met Thr Gln Asn Tyr Gln Asp Ser Pro Thr Leu Gln Ala  
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| ctc ctg gtg ctc gtg tgg ctc ccc caa agc ctg agt cta gac ctg att | 158 |    |    |  |
| Leu Leu Val Leu Val Trp Leu Pro Gln Ser Leu Ser Leu Asp Leu Ile |     |    |    |  |
| 20 25 30  |     |    |    |  |
| gcc tac gtg ccg cag ata aca gcc tgg gac ctg gaa ggg aag atc aca | 206 |    |    |  |
| Ala Tyr Val Pro Gln Ile Thr Ala Trp Asp Leu Glu Gly Lys Ile Thr |     |    |    |  |
| 35 40 45  |     |    |    |  |
| gcc act aca ttc tct ctg gag cag cct cgg tgc gtc ttt gat gag cat | 254 |    |    |  |
| Ala Thr Thr Phe Ser Leu Glu Gln Pro Arg Cys Val Phe Asp Glu His |     |    |    |  |
| 50 55 60  |     |    |    |  |
| gtc tca act aag gac acc atc tgg cta gtg gtg gct ttc agc aat gcc | 302 |    |    |  |
| Val Ser Thr Lys Asp Thr Ile Trp Leu Val Val Ala Phe Ser Asn Ala |     |    |    |  |
| 65 70 75  |     |    |    |  |
| tcc agg gac ttt cag aac cca cag act gct gct aag atc ccg acc ttc | 350 |    |    |  |
| Ser Arg Asp Phe Gln Asn Pro Gln Thr Ala Ala Lys Ile Pro Thr Phe |     |    |    |  |
| 80 85 90 95   |     |    |    |  |
| cca cag ctg ctg act gac ggc cac tat atg aca tta ccc ctg tcc ctg | 398 |    |    |  |
| Pro Gln Leu Leu Thr Asp Gly His Tyr Met Thr Leu Pro Leu Ser Leu |     |    |    |  |
| 100 105 110   |     |    |    |  |
| gat cag ctg cca tgt gag gac ctg acc ggt ggc agt gga ggt gtc ccc | 446 |    |    |  |
| Asp Gln Leu Pro Cys Glu Asp Leu Thr Gly Gly Ser Gly Gly Val Pro |     |    |    |  |
| 115 120 125   |     |    |    |  |
| gtg ctt cgg gtg ggc aat gat ttt ggc tgt tac cag cga ccc tat tgc | 494 |    |    |  |
| Val Leu Arg Val Gly Asn Asp Phe Gly Cys Tyr Gln Arg Pro Tyr Cys |     |    |    |  |
| 130 135 140   |     |    |    |  |
| aac gcc ccc ctc ccc agc cag ggc cct tac agt gtg aag ttc ctt gta | 542 |    |    |  |
| Asn Ala Pro Leu Pro Ser Gln Gly Pro Tyr Ser Val Lys Phe Leu Val |     |    |    |  |
| 145 150 155   |     |    |    |  |
| atg gat gcc gcc ggc cca ccc aag gct gag acg aag tgg tcc aac ccc | 590 |    |    |  |
| Met Asp Ala Ala Gly Pro Pro Lys Ala Glu Thr Lys Trp Ser Asn Pro |     |    |    |  |
| 160 165 170 175   |     |    |    |  |
| att tat ctc cac caa gga aag aat ccc aac tcc att gac aca tgg cct | 638 |    |    |  |
| Ile Tyr Leu His Gln Gly Lys Asn Pro Asn Ser Ile Asp Thr Trp Pro |     |    |    |  |
| 180 185 190   |     |    |    |  |
| ggc cga cgg agc ggc tgt atg atc gtc ata act tcc atc ctc tct gcc | 686 |    |    |  |
| Gly Arg Arg Ser Gly Cys Met Ile Val Ile Thr Ser Ile Leu Ser Ala |     |    |    |  |
| 195 200 205   |     |    |    |  |
| ctg gcc ggc ctc ttg ctc ctg gct ttc ctg gca gct tcc act acg cgt | 734 |    |    |  |
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Thr Thr Phe Ser Leu Glu Gln Pro Arg Cys Val Phe Asp Glu His Val  
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Ser Thr Lys Asp Thr Ile Trp Leu Val Val Ala Phe Ser Asn Ala Ser  
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Arg Asp Phe Gln Asn Pro Gln Thr Ala Ala Lys Ile Pro Thr Phe Pro  
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Gln Leu Leu Thr Asp Gly His Tyr Met Thr Leu Pro Leu Ser Leu Asp  
100 105 110

Gln Leu Pro Cys Glu Asp Leu Thr Gly Gly Ser Gly Gly Val Pro Val  
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Ala Pro Leu Pro Ser Gln Gly Pro Tyr Ser Val Lys Phe Leu Val Met  
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Asp Ala Ala Gly Pro Pro Lys Ala Glu Thr Lys Trp Ser Asn Pro Ile  
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Tyr Leu His Gln Gly Lys Asn Pro Asn Ser Ile Asp Thr Trp Pro Gly  
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| Leu Gln Gly Gln Pro Tyr Phe Ser Val Glu Pro Glu Thr Gly Ile Ile |      |
| 205 210 215   |      |
| agg act gct tta ccg aac atg aac aga gaa aac aga gag caa tac caa | 965  |
| Arg Thr Ala Leu Pro Asn Met Asn Arg Glu Asn Arg Glu Gln Tyr Gln |      |
| 220 225 230   |      |
| gtg gtc atc cag gcc aaa gac atg ggc ggc cag atg gga ggc tta tcg | 1013 |
| Val Val Ile Gln Ala Lys Asp Met Gly Gly Gln Met Gly Gly Leu Ser |      |
| 235 240 245 250   |      |
| ggg aca acc act gtg aac atc acg ctg aca gat gtc aat gac aac cca | 1061 |
| Gly Thr Thr Thr Val Asn Ile Thr Leu Thr Asp Val Asn Asp Asn Pro |      |
| 255 260 265   |      |
| cca cgt ttc ccc cag aac act att cat ctt cga gtt ctt gaa tcc tcc | 1109 |
| Pro Arg Phe Pro Gln Asn Thr Ile His Leu Arg Val Leu Glu Ser Ser |      |
| 270 275 280   |      |
| cca gtt ggc aca gcc att gga agt gtc aaa gca act gat gct gac act | 1157 |
| Pro Val Gly Thr Ala Ile Gly Ser Val Lys Ala Thr Asp Ala Asp Thr |      |
| 285 290 295   |      |
| ggg aaa aat gct gaa gta gaa tac cga att att gat ggt gac ggt act | 1205 |
| Gly Lys Asn Ala Glu Val Glu Tyr Arg Ile Ile Asp Gly Asp Gly Thr |      |
| 300 305 310   |      |
| gat atg ttt gac atc gtg act gag aag gac aca cag gaa ggc atc atc | 1253 |
| Asp Met Phe Asp Ile Val Thr Glu Lys Asp Thr Gln Glu Gly Ile Ile |      |
| 315 320 325 330   |      |
| act gtg aaa aag cca ctc gac tat gaa agc cga aga ctt tat act ctg | 1301 |
| Thr Val Lys Lys Pro Leu Asp Tyr Glu Ser Arg Arg Leu Tyr Thr Leu |      |
| 335 340 345   |      |
| aaa gtc gaa gca gaa aac acc cat gta gat ccc cgt ttt tat tac cta | 1349 |
| Lys Val Glu Ala Glu Asn Thr His Val Asp Pro Arg Phe Tyr Tyr Leu |      |
| 350 355 360   |      |
| gga cca ttt aaa gat act acc ata gtg aaa atc tct ata gaa gat gtg | 1397 |
| Gly Pro Phe Lys Asp Thr Thr Ile Val Lys Ile Ser Ile Glu Asp Val |      |
| 365 370 375   |      |
| gat gaa cct cct gtt ttt agt agg tcc tcc tat ctg ttt gaa gtt cat | 1445 |
| Asp Glu Pro Pro Val Phe Ser Arg Ser Ser Tyr Leu Phe Glu Val His |      |
| 380 385 390   |      |
| gaa gat att gaa gtg ggc aca atc att ggt act gta atg gca agg gac | 1493 |
| Glu Asp Ile Glu Val Gly Thr Ile Ile Gly Thr Val Met Ala Arg Asp |      |
| 395 400 405 410   |      |
| cca gat tct att tcc agc ccc att aga ttt tcc ttg gat cgc cat act | 1541 |
| Pro Asp Ser Ile Ser Ser Pro Ile Arg Phe Ser Leu Asp Arg His Thr |      |

| 415 |     |     |     |     |     |     |     |     |     | 420 |     |     |     |     | 425 |      |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|--|--|--|
| gac | ctt | gac | aga | atc | ttt | aac | att | cat | tca | gga | aat | gga | tct | ctt | tat | 1589 |  |  |  |  |
| Asp | Leu | Asp | Arg | Ile | Phe | Asn | Ile | His | Ser | Gly | Asn | Gly | Ser | Leu | Tyr |      |  |  |  |  |
|     |     |     | 430 |     |     |     |     | 435 |     |     |     |     | 440 |     |     |      |  |  |  |  |
| aca | tca | aaa | cct | ctt | gac | cgt | gaa | cta | tct | cag | tgg | cat | aat | tcg | tta | 1637 |  |  |  |  |
| Thr | Ser | Lys | Pro | Leu | Asp | Arg | Glu | Leu | Ser | Gln | Trp | His | Asn | Ser | Leu |      |  |  |  |  |
|     |     | 445 |     |     |     |     | 450 |     |     |     |     | 455 |     |     |     |      |  |  |  |  |
| gtt | att | gct | gct | gaa | atc | aac | aat | ccc | aaa | gag | aca | aca | cgc | gtg | gct | 1685 |  |  |  |  |
| Val | Ile | Ala | Ala | Glu | Ile | Asn | Asn | Pro | Lys | Glu | Thr | Thr | Arg | Val | Ala |      |  |  |  |  |
|     | 460 |     |     |     |     | 465 |     |     |     |     | 470 |     |     |     |     |      |  |  |  |  |
| gtt | ttt | gtg | aga | att | ttg | gat | gtt | aat | gac | aat | gcc | cca | cag | ttt | gct | 1733 |  |  |  |  |
| Val | Phe | Val | Arg | Ile | Leu | Asp | Val | Asn | Asp | Asn | Ala | Pro | Gln | Phe | Ala |      |  |  |  |  |
| 475 |     |     |     |     | 480 |     |     |     | 485 |     |     |     |     |     | 490 |      |  |  |  |  |
| gtg | ttc | tat | gac | act | ttt | gta | tgt | gaa | aat | gcc | aga | cca | ggg | cag | cta | 1781 |  |  |  |  |
| Val | Phe | Tyr | Asp | Thr | Phe | Val | Cys | Glu | Asn | Ala | Arg | Pro | Gly | Gln | Leu |      |  |  |  |  |
|     |     |     | 495 |     |     |     |     |     | 500 |     |     |     |     | 505 |     |      |  |  |  |  |
| ata | cag | act | ata | agt | gca | gta | gac | aaa | gat | gac | cct | tta | ggg | gga | cag | 1829 |  |  |  |  |
| Ile | Gln | Thr | Ile | Ser | Ala | Val | Asp | Lys | Asp | Asp | Pro | Leu | Gly | Gly | Gln |      |  |  |  |  |
|     |     |     | 510 |     |     |     |     | 515 |     |     |     |     | 520 |     |     |      |  |  |  |  |
| aaa | ttt | ttt | ttc | agt | tta | gct | gct | gtc | aat | cca | aac | ttc | aca | gta | cag | 1877 |  |  |  |  |
| Lys | Phe | Phe | Phe | Ser | Leu | Ala | Ala | Val | Asn | Pro | Asn | Phe | Thr | Val | Gln |      |  |  |  |  |
|     |     | 525 |     |     |     |     | 530 |     |     |     |     | 535 |     |     |     |      |  |  |  |  |
| gat | aat | gaa | gat | aat | act | gcc | aga | atc | tta | acc | aga | aaa | aat | gga | ttc | 1925 |  |  |  |  |
| Asp | Asn | Glu | Asp | Asn | Thr | Ala | Arg | Ile | Leu | Thr | Arg | Lys | Asn | Gly | Phe |      |  |  |  |  |
|     | 540 |     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     |      |  |  |  |  |
| aat | aga | cat | gaa | atc | agt | acc | tat | ctc | ttg | cct | gtg | gtg | ata | tca | gac | 1973 |  |  |  |  |
| Asn | Arg | His | Glu | Ile | Ser | Thr | Tyr | Leu | Leu | Pro | Val | Val | Ile | Ser | Asp |      |  |  |  |  |
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| aat | gat | tac | ccg | att | cag | agc | agc | aca | ggc | aca | ctg | acc | att | cga | gtg | 2021 |  |  |  |  |
| Asn | Asp | Tyr | Pro | Ile | Gln | Ser | Ser | Thr | Gly | Thr | Leu | Thr | Ile | Arg | Val |      |  |  |  |  |
|     |     |     | 575 |     |     |     |     |     | 580 |     |     |     |     | 585 |     |      |  |  |  |  |
| tgt | gct | tgt | gac | agc | caa | ggc | aac | atg | caa | tcc | tgc | agt | gct | gaa | gcc | 2069 |  |  |  |  |
| Cys | Ala | Cys | Asp | Ser | Gln | Gly | Asn | Met | Gln | Ser | Cys | Ser | Ala | Glu | Ala |      |  |  |  |  |
|     |     |     | 590 |     |     |     | 595 |     |     |     |     |     | 600 |     |     |      |  |  |  |  |
| ctg | ctc | ctc | cct | gcc | ggc | ctc | agc | act | ggg | gcc | ttg | atc | gcc | atc | ctc | 2117 |  |  |  |  |
| Leu | Leu | Leu | Pro | Ala | Gly | Leu | Ser | Thr | Gly | Ala | Leu | Ile | Ala | Ile | Leu |      |  |  |  |  |
|     |     | 605 |     |     |     |     | 610 |     |     |     |     | 615 |     |     |     |      |  |  |  |  |
| ctc | tgc | atc | atc | att | cta | ctg | gtt | ata | gta | gta | ctg | ttt | gca | gct | ctg | 2165 |  |  |  |  |
| Leu | Cys | Ile | Ile | Ile | Leu | Leu | Val | Ile | Val | Val | Leu | Phe | Ala | Ala | Leu |      |  |  |  |  |
|     | 620 |     |     |     |     |     | 625 |     |     |     | 630 |     |     |     |     |      |  |  |  |  |
| aaa | gga | cag | cga | aaa | aaa | gag | cct | ctg | atc | ttg | tca | aaa | gaa | gat | atc | 2213 |  |  |  |  |
| Lys | Gly | Gln | Arg | Lys | Lys | Glu | Pro | Leu | Ile | Leu | Ser | Lys | Glu | Asp | Ile |      |  |  |  |  |
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|   |      |
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| aga gac aac att gtg agc tat aac gat gag ggt ggt gga gag gag gac   | 2261 |
| Arg Asp Asn Ile Val Ser Tyr Asn Asp Glu Gly Gly Gly Glu Glu Asp   |      |
| 655 660 665   |      |
|   |      |
| acc cag gcc ttt gat atc ggc acc ctg agg aat cct gca gcc att gag   | 2309 |
| Thr Gln Ala Phe Asp Ile Gly Thr Leu Arg Asn Pro Ala Ala Ile Glu   |      |
| 670 675 680   |      |
|   |      |
| gaa aaa aag ctc cgg cga gat att att cca gaa acg tta ttt att cct   | 2357 |
| Glu Lys Lys Leu Arg Arg Asp Ile Ile Pro Glu Thr Leu Phe Ile Pro   |      |
| 685 690 695   |      |
|   |      |
| cgg agg act cct aca gct cca gat aac acg gac gtc cgg gat ttc att   | 2405 |
| Arg Arg Thr Pro Thr Ala Pro Asp Asn Thr Asp Val Arg Asp Phe Ile   |      |
| 700 705 710   |      |
|   |      |
| aat gaa agg cta aaa gag cat gat ctt gac ccc acc gca ccc ccc tac   | 2453 |
| Asn Glu Arg Leu Lys Glu His Asp Leu Asp Pro Thr Ala Pro Pro Tyr   |      |
| 715 720 725 730   |      |
|   |      |
| gac tca ctt gca acc tat gcc tat gaa gga aat gat tcc att gct gaa   | 2501 |
| Asp Ser Leu Ala Thr Tyr Ala Tyr Glu Gly Asn Asp Ser Ile Ala Glu   |      |
| 735 740 745   |      |
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| tct ctg agt tca tta gaa tca ggt act act gaa gga gac caa aac tac   | 2549 |
| Ser Leu Ser Ser Leu Glu Ser Gly Thr Thr Glu Gly Asp Gln Asn Tyr   |      |
| 750 755 760   |      |
|   |      |
| gat tac ctc cga gaa tgg ggc cct cgg ttt aat aag cta gca gaa atg   | 2597 |
| Asp Tyr Leu Arg Glu Trp Gly Pro Arg Phe Asn Lys Leu Ala Glu Met   |      |
| 765 770 775   |      |
|   |      |
| tat ggt ggt ggg gaa agt gac aaa gac tct taacgtagga tatatgttct     | 2647 |
| Tyr Gly Gly Gly Glu Ser Asp Lys Asp Ser                           |      |
| 780 785   |      |
|   |      |
| gttcaaacaa gagaaagtaa ctctacccat gctgtctcca cttcacaata tttgatattc | 2707 |
| aggagcattt cctgcagtca gcacaatttt tttctca                          | 2744 |

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 Gln Gln Arg Ile Leu Ser Ser Arg Val Pro Arg Ser Asp Gly Lys Ile  
 35 40 45

Leu His Arg Gln Lys Arg Gly Trp Met Trp Asn Gln Phe Phe Leu Leu  
 50 55 60  
 Glu Glu Tyr Thr Gly Ser Asp Tyr Gln Tyr Val Gly Lys Leu His Ser  
 65 70 75 80  
 Asp Gln Asp Lys Gly Asp Gly Ser Leu Lys Tyr Ile Leu Ser Gly Asp  
 85 90 95  
 Gly Ala Gly Thr Leu Phe Ile Ile Asp Glu Lys Thr Gly Asp Ile His  
 100 105 110  
 Ala Thr Arg Arg Ile Asp Arg Glu Glu Lys Ala Phe Tyr Thr Leu Arg  
 115 120 125  
 Ala Gln Ala Ile Asn Arg Arg Thr Leu Arg Pro Val Glu Pro Glu Ser  
 130 135 140  
 Glu Phe Val Ile Lys Ile His Asp Ile Asn Asp Asn Glu Pro Thr Phe  
 145 150 155 160  
 Pro Glu Glu Ile Tyr Thr Ala Ser Val Pro Glu Met Ser Val Val Gly  
 165 170 175  
 Thr Ser Val Val Gln Val Thr Ala Thr Asp Ala Asp Asp Pro Ser Tyr  
 180 185 190  
 Gly Asn Ser Ala Arg Val Ile Tyr Ser Ile Leu Gln Gly Gln Pro Tyr  
 195 200 205  
 Phe Ser Val Glu Pro Glu Thr Gly Ile Ile Arg Thr Ala Leu Pro Asn  
 210 215 220  
 Met Asn Arg Glu Asn Arg Glu Gln Tyr Gln Val Val Ile Gln Ala Lys  
 225 230 235 240  
 Asp Met Gly Gly Gln Met Gly Gly Leu Ser Gly Thr Thr Thr Val Asn  
 245 250 255  
 Ile Thr Leu Thr Asp Val Asn Asp Asn Pro Pro Arg Phe Pro Gln Asn  
 260 265 270  
 Thr Ile His Leu Arg Val Leu Glu Ser Ser Pro Val Gly Thr Ala Ile  
 275 280 285  
 Gly Ser Val Lys Ala Thr Asp Ala Asp Thr Gly Lys Asn Ala Glu Val  
 290 295 300  
 Glu Tyr Arg Ile Ile Asp Gly Asp Gly Thr Asp Met Phe Asp Ile Val  
 305 310 315 320  
 Thr Glu Lys Asp Thr Gln Glu Gly Ile Ile Thr Val Lys Lys Pro Leu  
 325 330 335  
 Asp Tyr Glu Ser Arg Arg Leu Tyr Thr Leu Lys Val Glu Ala Glu Asn  
 340 345 350

Thr His Val Asp Pro Arg Phe Tyr Tyr Leu Gly Pro Phe Lys Asp Thr  
 355 360 365  
 Thr Ile Val Lys Ile Ser Ile Glu Asp Val Asp Glu Pro Pro Val Phe  
 370 375 380  
 Ser Arg Ser Ser Tyr Leu Phe Glu Val His Glu Asp Ile Glu Val Gly  
 385 390 395 400  
 Thr Ile Ile Gly Thr Val Met Ala Arg Asp Pro Asp Ser Ile Ser Ser  
 405 410 415  
 Pro Ile Arg Phe Ser Leu Asp Arg His Thr Asp Leu Asp Arg Ile Phe  
 420 425 430  
 Asn Ile His Ser Gly Asn Gly Ser Leu Tyr Thr Ser Lys Pro Leu Asp  
 435 440 445  
 Arg Glu Leu Ser Gln Trp His Asn Ser Leu Val Ile Ala Ala Glu Ile  
 450 455 460  
 Asn Asn Pro Lys Glu Thr Thr Arg Val Ala Val Phe Val Arg Ile Leu  
 465 470 475 480  
 Asp Val Asn Asp Asn Ala Pro Gln Phe Ala Val Phe Tyr Asp Thr Phe  
 485 490 495  
 Val Cys Glu Asn Ala Arg Pro Gly Gln Leu Ile Gln Thr Ile Ser Ala  
 500 505 510  
 Val Asp Lys Asp Asp Pro Leu Gly Gly Gln Lys Phe Phe Phe Ser Leu  
 515 520 525  
 Ala Ala Val Asn Pro Asn Phe Thr Val Gln Asp Asn Glu Asp Asn Thr  
 530 535 540  
 Ala Arg Ile Leu Thr Arg Lys Asn Gly Phe Asn Arg His Glu Ile Ser  
 545 550 555 560  
 Thr Tyr Leu Leu Pro Val Val Ile Ser Asp Asn Asp Tyr Pro Ile Gln  
 565 570 575  
 Ser Ser Thr Gly Thr Leu Thr Ile Arg Val Cys Ala Cys Asp Ser Gln  
 580 585 590  
 Gly Asn Met Gln Ser Cys Ser Ala Glu Ala Leu Leu Leu Pro Ala Gly  
 595 600 605  
 Leu Ser Thr Gly Ala Leu Ile Ala Ile Leu Leu Cys Ile Ile Ile Leu  
 610 615 620  
 Leu Val Ile Val Val Leu Phe Ala Ala Leu Lys Gly Gln Arg Lys Lys  
 625 630 635 640  
 Glu Pro Leu Ile Leu Ser Lys Glu Asp Ile Arg Asp Asn Ile Val Ser  
 645 650 655

Tyr Asn Asp Glu Gly Gly Gly Glu Glu Asp Thr Gln Ala Phe Asp Ile  
 660 665 670  
 Gly Thr Leu Arg Asn Pro Ala Ala Ile Glu Glu Lys Lys Leu Arg Arg  
 675 680 685  
 Asp Ile Ile Pro Glu Thr Leu Phe Ile Pro Arg Arg Thr Pro Thr Ala  
 690 695 700  
 Pro Asp Asn Thr Asp Val Arg Asp Phe Ile Asn Glu Arg Leu Lys Glu  
 705 710 715 720  
 His Asp Leu Asp Pro Thr Ala Pro Pro Tyr Asp Ser Leu Ala Thr Tyr  
 725 730 735  
 Ala Tyr Glu Gly Asn Asp Ser Ile Ala Glu Ser Leu Ser Ser Leu Glu  
 740 745 750  
 Ser Gly Thr Thr Glu Gly Asp Gln Asn Tyr Asp Tyr Leu Arg Glu Trp  
 755 760 765  
 Gly Pro Arg Phe Asn Lys Leu Ala Glu Met Tyr Gly Gly Gly Glu Ser  
 770 775 780  
 Asp Lys Asp Ser  
 785

<210> 7  
 <211> 1820  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (285)..(1703)

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 aaaaatgaag gatacaggct aagggaacaa ctgcagtgtg atggaaactg agttttaatg 120  
 atgcctctta ggaaatgact tccaacatgt agtacactat tcatcttcga gttcttgaat 180  
 cctccccagt tggcacagcc attggaagtg tcaaagcaac tgatgctgac actgggaaaa 240  
 atgctgaagt agaataccga attattgatg gtgacgggtac tgat atg ttt gac atc 296  
 Met Phe Asp Ile  
 1

gtg act gag aag gac aca cag gaa ggc atc atc act gtg aaa aag cca 344  
 Val Thr Glu Lys Asp Thr Gln Glu Gly Ile Ile Thr Val Lys Lys Pro  
 5 10 15 20  
 ctc gac tat gag agc cga aga ctt tat act ctg aaa gtc gaa gca gaa 392  
 Leu Asp Tyr Glu Ser Arg Arg Leu Tyr Thr Leu Lys Val Glu Ala Glu  
 25 30 35

aac acc cat gta gat ccc cgt ttt tat tac cta gga cca ttt aaa gat 440  
 Asn Thr His Val Asp Pro Arg Phe Tyr Tyr Leu Gly Pro Phe Lys Asp  
 40 45 50

act acc ata gtg aaa atc tct ata gaa gat gtg gat gaa cct cct gtt 488  
 Thr Thr Ile Val Lys Ile Ser Ile Glu Asp Val Asp Glu Pro Pro Val  
 55 60 65

ttt agt agg tcc tcc tat ctg ttt gaa gtt cat gaa gat att gaa gtg 536  
 Phe Ser Arg Ser Ser Tyr Leu Phe Glu Val His Glu Asp Ile Glu Val  
 70 75 80

ggc aca atc att ggt act gta atg gca agg gac cca gat tct att tcc 584  
 Gly Thr Ile Ile Gly Thr Val Met Ala Arg Asp Pro Asp Ser Ile Ser  
 85 90 95 100

agc ccc att aga ttt tcc ttg gat cgc cat act gac ctt gac aga atc 632  
 Ser Pro Ile Arg Phe Ser Leu Asp Arg His Thr Asp Leu Asp Arg Ile  
 105 110 115

ttt aac att cat tca gga aat gga tct ctt tat aca tca aaa cct ctt 680  
 Phe Asn Ile His Ser Gly Asn Gly Ser Leu Tyr Thr Ser Lys Pro Leu  
 120 125 130

gac cgt gaa cta tct cag tgg cat aat tcg tta gtt att gct gct gaa 728  
 Asp Arg Glu Leu Ser Gln Trp His Asn Ser Leu Val Ile Ala Ala Glu  
 135 140 145

atc aac aat ccc aaa gag aca aca cgc gtg gct gtt ttt gtg aga att 776  
 Ile Asn Asn Pro Lys Glu Thr Thr Arg Val Ala Val Phe Val Arg Ile  
 150 155 160

ttg gat gtt aat gac aat gcc cca cag ttt gct gtg ttc tat gac act 824  
 Leu Asp Val Asn Asp Asn Ala Pro Gln Phe Ala Val Phe Tyr Asp Thr  
 165 170 175 180

ttt gta tgt gaa aat gcc aga cca ggg cag cta ata cag act ata agt 872  
 Phe Val Cys Glu Asn Ala Arg Pro Gly Gln Leu Ile Gln Thr Ile Ser  
 185 190 195

gca gta gac aaa gat gac cct tta ggt gga cag aaa ttt ttt ttc agt 920  
 Ala Val Asp Lys Asp Asp Pro Leu Gly Gly Gln Lys Phe Phe Phe Ser  
 200 205 210

tta gct gct gtc aat cca aac ttc aca gta cag gat aat gaa gat aat 968  
 Leu Ala Ala Val Asn Pro Asn Phe Thr Val Gln Asp Asn Glu Asp Asn  
 215 220 225

act gcc aga atc tta acc aga aaa aat gga ttc aat aga cat gaa atc 1016  
 Thr Ala Arg Ile Leu Thr Arg Lys Asn Gly Phe Asn Arg His Glu Ile  
 230 235 240

agt acc tat ctc ttg cct gtg gtg ata tca gac aat gat tac ccg att 1064  
 Ser Thr Tyr Leu Leu Pro Val Val Ile Ser Asp Asn Asp Tyr Pro Ile  
 245 250 255 260

cag agc agc aca ggc aca ctg acc att cga gtg tgt gct tgt gac agc 1112  
Gln Ser Ser Thr Gly Thr Leu Thr Ile Arg Val Cys Ala Cys Asp Ser  
265 270 275

caa ggc aac atg caa tcc tgc agt gct gaa gcc ctg ctc ctc cct gcc 1160  
Gln Gly Asn Met Gln Ser Cys Ser Ala Glu Ala Leu Leu Leu Pro Ala  
280 285 290

ggc ctc agc act ggg gcc ttg atc gcc atc ctc ctc tgc atc atc att 1208  
Gly Leu Ser Thr Gly Ala Leu Ile Ala Ile Leu Leu Cys Ile Ile Ile  
295 300 305

cta ctg gtt ata gta gta ctg ttt gca gct ctg aaa gga cag cga aaa 1256  
Leu Leu Val Ile Val Val Leu Phe Ala Ala Leu Lys Gly Gln Arg Lys  
310 315 320

aaa gag cct ctg atc ttg tca aaa gaa gat atc aga gac aac att gtg 1304  
Lys Glu Pro Leu Ile Leu Ser Lys Glu Asp Ile Arg Asp Asn Ile Val  
325 330 335 340

agc tat aac gat gag ggt ggt gga gag gag gac acc cag gcc ttt gat 1352  
Ser Tyr Asn Asp Glu Gly Gly Gly Glu Glu Asp Thr Gln Ala Phe Asp  
345 350 355

atc ggc acc ctg agg aat cct gca gcc att gag gaa aaa aag ctc cgg 1400  
Ile Gly Thr Leu Arg Asn Pro Ala Ala Ile Glu Glu Lys Lys Leu Arg  
360 365 370

cga gat att att cca gaa acg tta ttt att cct cgg agg act cct aca 1448  
Arg Asp Ile Ile Pro Glu Thr Leu Phe Ile Pro Arg Arg Thr Pro Thr  
375 380 385

gct cca gat aac acg gac gtc cgg gat ttc att aat gaa agg cta aaa 1496  
Ala Pro Asp Asn Thr Asp Val Arg Asp Phe Ile Asn Glu Arg Leu Lys  
390 395 400

gag cat gat ctt gac ccc acc gca ccc ccc tac gac tca ctt gca acc 1544  
Glu His Asp Leu Asp Pro Thr Ala Pro Pro Tyr Asp Ser Leu Ala Thr  
405 410 415 420

tat gcc tat gaa gga aat gat tcc att gct gaa tct ctg agt tca tta 1592  
Tyr Ala Tyr Glu Gly Asn Asp Ser Ile Ala Glu Ser Leu Ser Ser Leu  
425 430 435

gaa tca ggt act act gaa gga gac caa aac tac gat tac ctc cga gaa 1640  
Glu Ser Gly Thr Thr Glu Gly Asp Gln Asn Tyr Asp Tyr Leu Arg Glu  
440 445 450

tgg ggc cct cgg ttt aat aag cta gca gaa atg tat ggt ggt ggg gaa 1688  
Trp Gly Pro Arg Phe Asn Lys Leu Ala Glu Met Tyr Gly Gly Gly Glu  
455 460 465

agc gac aaa gac tct taacgtagga tatatgttct gttcaaaca gagaaagtaa 1743  
Ser Asp Lys Asp Ser  
470

ctctacccat gctgtctcca cttcacacaata tttgatattc aggagcattt cctgcagtca 1803

gcacaatttt tttctca

1820

<210> 8  
<211> 473  
<212> PRT  
<213> Homo sapiens

<400> 8  
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1 5 10 15  
Val Lys Lys Pro Leu Asp Tyr Glu Ser Arg Arg Leu Tyr Thr Leu Lys  
20 25 30  
Val Glu Ala Glu Asn Thr His Val Asp Pro Arg Phe Tyr Tyr Leu Gly  
35 40 45  
Pro Phe Lys Asp Thr Thr Ile Val Lys Ile Ser Ile Glu Asp Val Asp  
50 55 60  
Glu Pro Pro Val Phe Ser Arg Ser Ser Tyr Leu Phe Glu Val His Glu  
65 70 75 80  
Asp Ile Glu Val Gly Thr Ile Ile Gly Thr Val Met Ala Arg Asp Pro  
85 90 95  
Asp Ser Ile Ser Ser Pro Ile Arg Phe Ser Leu Asp Arg His Thr Asp  
100 105 110  
Leu Asp Arg Ile Phe Asn Ile His Ser Gly Asn Gly Ser Leu Tyr Thr  
115 120 125  
Ser Lys Pro Leu Asp Arg Glu Leu Ser Gln Trp His Asn Ser Leu Val  
130 135 140  
Ile Ala Ala Glu Ile Asn Asn Pro Lys Glu Thr Thr Arg Val Ala Val  
145 150 155 160  
Phe Val Arg Ile Leu Asp Val Asn Asp Asn Ala Pro Gln Phe Ala Val  
165 170 175  
Phe Tyr Asp Thr Phe Val Cys Glu Asn Ala Arg Pro Gly Gln Leu Ile  
180 185 190  
Gln Thr Ile Ser Ala Val Asp Lys Asp Asp Pro Leu Gly Gly Gln Lys  
195 200 205  
Phe Phe Phe Ser Leu Ala Ala Val Asn Pro Asn Phe Thr Val Gln Asp  
210 215 220  
Asn Glu Asp Asn Thr Ala Arg Ile Leu Thr Arg Lys Asn Gly Phe Asn  
225 230 235 240  
Arg His Glu Ile Ser Thr Tyr Leu Leu Pro Val Val Ile Ser Asp Asn  
245 250 255

Asp Tyr Pro Ile Gln Ser Ser Thr Gly Thr Leu Thr Ile Arg Val Cys  
 260 265 270  
 Ala Cys Asp Ser Gln Gly Asn Met Gln Ser Cys Ser Ala Glu Ala Leu  
 275 280 285  
 Leu Leu Pro Ala Gly Leu Ser Thr Gly Ala Leu Ile Ala Ile Leu Leu  
 290 295 300  
 Cys Ile Ile Ile Leu Leu Val Ile Val Val Leu Phe Ala Ala Leu Lys  
 305 310 315 320  
 Gly Gln Arg Lys Lys Glu Pro Leu Ile Leu Ser Lys Glu Asp Ile Arg  
 325 330 335  
 Asp Asn Ile Val Ser Tyr Asn Asp Glu Gly Gly Gly Glu Glu Asp Thr  
 340 345 350  
 Gln Ala Phe Asp Ile Gly Thr Leu Arg Asn Pro Ala Ala Ile Glu Glu  
 355 360 365  
 Lys Lys Leu Arg Arg Asp Ile Ile Pro Glu Thr Leu Phe Ile Pro Arg  
 370 375 380  
 Arg Thr Pro Thr Ala Pro Asp Asn Thr Asp Val Arg Asp Phe Ile Asn  
 385 390 395 400  
 Glu Arg Leu Lys Glu His Asp Leu Asp Pro Thr Ala Pro Pro Tyr Asp  
 405 410 415  
 Ser Leu Ala Thr Tyr Ala Tyr Glu Gly Asn Asp Ser Ile Ala Glu Ser  
 420 425 430  
 Leu Ser Ser Leu Glu Ser Gly Thr Thr Glu Gly Asp Gln Asn Tyr Asp  
 435 440 445  
 Tyr Leu Arg Glu Trp Gly Pro Arg Phe Asn Lys Leu Ala Glu Met Tyr  
 450 455 460  
 Gly Gly Gly Glu Ser Asp Lys Asp Ser  
 465 470

<210> 9  
 <211> 1508  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (226)..(1458)

<220>  
 <221> variation  
 <222> (1)..(1508)  
 <223> N may be any nucleotide



<400> 9

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caattttaat agtccgtaat tgatggcagc ctgctgtggt acatgtgtga aagattatca 120  
ctttgaatat acggaatgtg atagcagtggt ctccaggtgg agagttgcca ttccaaattc 180  
tgcagtgagac tgctctggcc tgcctgaccc agtgagagggc aaaga atg cac tct tct 237  
Met His Ser Ser

1

tgg atc cct cgt gga aac tac ata gaa tct aat cgt gat gac tgc acg 285  
Trp Ile Pro Arg Gly Asn Tyr Ile Glu Ser Asn Arg Asp Asp Cys Thr  
5 10 15 20

gtg tct ttg atc tat gct gtg cac ctt aag aag tca ggc tat gtc ttc 333  
Val Ser Leu Ile Tyr Ala Val His Leu Lys Lys Ser Gly Tyr Val Phe  
25 30 35

ttt gag tac cag tat gtc gac aac aac atc ttc ttt gag ttc ttt att 381  
Phe Glu Tyr Gln Tyr Val Asp Asn Asn Ile Phe Phe Glu Phe Phe Ile  
40 45 50

caa aat gat cag tgc cag gag atg gac acc acc act gac aag tgg gta 429  
Gln Asn Asp Gln Cys Gln Glu Met Asp Thr Thr Thr Asp Lys Trp Val  
55 60 65

aaa ctt aca gac aat gga gaa tgg ggc tct cat tct gta atg ctg aaa 477  
Lys Leu Thr Asp Asn Gly Glu Trp Gly Ser His Ser Val Met Leu Lys  
70 75 80

tca ggc aca aac ata ctc tac tgg aga act aca ggc atc ctt atg ggt 525  
Ser Gly Thr Asn Ile Leu Tyr Trp Arg Thr Thr Gly Ile Leu Met Gly  
85 90 95 100

tct aag gcg gtc aag cct gtg ctg gta aaa aat atc aca att gaa ggg 573  
Ser Lys Ala Val Lys Pro Val Leu Val Lys Asn Ile Thr Ile Glu Gly  
105 110 115

gtg gcg tac aca tca gaa tgt ttt cct tgc aag cca ggc aca ttc agc 621  
Val Ala Tyr Thr Ser Glu Cys Phe Pro Cys Lys Pro Gly Thr Phe Ser  
120 125 130

aac aaa cca ggt tca ttc aac tgc cag gtg tgt ccc aga aac acc tat 669  
Asn Lys Pro Gly Ser Phe Asn Cys Gln Val Cys Pro Arg Asn Thr Tyr  
135 140 145

tct gag aaa gga gcc aaa gaa tgt ata agg tgt aaa gac gac tct caa 717  
Ser Glu Lys Gly Ala Lys Glu Cys Ile Arg Cys Lys Asp Asp Ser Gln  
150 155 160

ttt tca gag gaa gga tcc agt gag tgt aca gag cgc cct ccc tgt acc 765  
Phe Ser Glu Glu Gly Ser Ser Glu Cys Thr Glu Arg Pro Pro Cys Thr  
165 170 175 180

aca aaa gac tat ttc cag atc cat act cca tgt gat gaa gaa gga aag 813

|   |      |
|---|------|
| Thr Lys Asp Tyr Phe Gln Ile His Thr Pro Cys Asp Glu Glu Gly Lys |      |
| 185 190 195   |      |
| aca cag ata atg tac aag tgg ata gag ccc aaa atc tgc cgg gag gat | 861  |
| Thr Gln Ile Met Tyr Lys Trp Ile Glu Pro Lys Ile Cys Arg Glu Asp |      |
| 200 205 210   |      |
| ctc aca gat gct att aga ttg ccc cct tct gga gag aag aag gat tgt | 909  |
| Leu Thr Asp Ala Ile Arg Leu Pro Pro Ser Gly Glu Lys Lys Asp Cys |      |
| 215 220 225   |      |
| ccg cct tgc aac cct gga ttt tat aac aat gga tca tct tct tgc cat | 957  |
| Pro Pro Cys Asn Pro Gly Phe Tyr Asn Asn Gly Ser Ser Ser Cys His |      |
| 230 235 240   |      |
| ccc tgt cct cct gga aca ttt tca gat gga acc aaa gaa tgt aga cca | 1005 |
| Pro Cys Pro Pro Gly Thr Phe Ser Asp Gly Thr Lys Glu Cys Arg Pro |      |
| 245 250 255 260   |      |
| tgt cca gca gga acg gag cct gca ctt ggc ttt gaa tat aaa tgg tgg | 1053 |
| Cys Pro Ala Gly Thr Glu Pro Ala Leu Gly Phe Glu Tyr Lys Trp Trp |      |
| 265 270 275   |      |
| aat gtc ctt cct ggc aac atg aaa act tcc tgc ttc aat gtt ggg aat | 1101 |
| Asn Val Leu Pro Gly Asn Met Lys Thr Ser Cys Phe Asn Val Gly Asn |      |
| 280 285 290   |      |
| tca aag tgc gat gga atg aat ggt tgg gag gtg gct gga gat cat atc | 1149 |
| Ser Lys Cys Asp Gly Met Asn Gly Trp Glu Val Ala Gly Asp His Ile |      |
| 295 300 305   |      |
| cag agt ggg gct gga ggt tct gac aat gat tac ctg atc tta aac ttg | 1197 |
| Gln Ser Gly Ala Gly Gly Ser Asp Asn Asp Tyr Leu Ile Leu Asn Leu |      |
| 310 315 320   |      |
| cat atc cca gga ttt aaa cca cca aca tct atg act gga gcc acg ggt | 1245 |
| His Ile Pro Gly Phe Lys Pro Pro Thr Ser Met Thr Gly Ala Thr Gly |      |
| 325 330 335 340   |      |
| tct gaa cta gga aga ata aca ttt gtc ttt gag acc ctc tgt tca gct | 1293 |
| Ser Glu Leu Gly Arg Ile Thr Phe Val Phe Glu Thr Leu Cys Ser Ala |      |
| 345 350 355   |      |
| gac tgt gtt ttg tac ttc atg gtg gat att aat aga aaa agt aca aat | 1341 |
| Asp Cys Val Leu Tyr Phe Met Val Asp Ile Asn Arg Lys Ser Thr Asn |      |
| 360 365 370   |      |
| gtg gta gaa tcg tgg ggt gga acc aaa gaa aaa caa gct tac acc cat | 1389 |
| Val Val Glu Ser Trp Gly Gly Thr Lys Glu Lys Gln Ala Tyr Thr His |      |
| 375 380 385   |      |
| atc atc ttc aag aat gca act ttt aca ttt aca tgg ggc att ccc aga | 1437 |
| Ile Ile Phe Lys Asn Ala Thr Phe Thr Phe Thr Trp Gly Ile Pro Arg |      |
| 390 395 400   |      |
| gaa cta att cag ggt cca aga taatagacgg ttcnccatt gacatgtttg     | 1488 |
| Glu Leu Ile Gln Gly Pro Arg                                     |      |

405

410

aaggatttat tcctattcac

1508

&lt;210&gt; 10

&lt;211&gt; 411

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 10

Met His Ser Ser Trp Ile Pro Arg Gly Asn Tyr Ile Glu Ser Asn Arg  
 1 5 10 15

Asp Asp Cys Thr Val Ser Leu Ile Tyr Ala Val His Leu Lys Lys Ser  
 20 25 30

Gly Tyr Val Phe Phe Glu Tyr Gln Tyr Val Asp Asn Asn Ile Phe Phe  
 35 40 45

Glu Phe Phe Ile Gln Asn Asp Gln Cys Gln Glu Met Asp Thr Thr Thr  
 50 55 60

Asp Lys Trp Val Lys Leu Thr Asp Asn Gly Glu Trp Gly Ser His Ser  
 65 70 75 80

Val Met Leu Lys Ser Gly Thr Asn Ile Leu Tyr Trp Arg Thr Thr Gly  
 85 90 95

Ile Leu Met Gly Ser Lys Ala Val Lys Pro Val Leu Val Lys Asn Ile  
 100 105 110

Thr Ile Glu Gly Val Ala Tyr Thr Ser Glu Cys Phe Pro Cys Lys Pro  
 115 120 125

Gly Thr Phe Ser Asn Lys Pro Gly Ser Phe Asn Cys Gln Val Cys Pro  
 130 135 140

Arg Asn Thr Tyr Ser Glu Lys Gly Ala Lys Glu Cys Ile Arg Cys Lys  
 145 150 155 160

Asp Asp Ser Gln Phe Ser Glu Glu Gly Ser Ser Glu Cys Thr Glu Arg  
 165 170 175

Pro Pro Cys Thr Thr Lys Asp Tyr Phe Gln Ile His Thr Pro Cys Asp  
 180 185 190

Glu Glu Gly Lys Thr Gln Ile Met Tyr Lys Trp Ile Glu Pro Lys Ile  
 195 200 205

Cys Arg Glu Asp Leu Thr Asp Ala Ile Arg Leu Pro Pro Ser Gly Glu  
 210 215 220

Lys Lys Asp Cys Pro Pro Cys Asn Pro Gly Phe Tyr Asn Asn Gly Ser  
 225 230 235 240

Ser Ser Cys His Pro Cys Pro Pro Gly Thr Phe Ser Asp Gly Thr Lys

| 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Cys | Arg | Pro | Cys | Pro | Ala | Gly | Thr | Glu | Pro | Ala | Leu | Gly | Phe | Glu |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Tyr | Lys | Trp | Trp | Asn | Val | Leu | Pro | Gly | Asn | Met | Lys | Thr | Ser | Cys | Phe |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Asn | Val | Gly | Asn | Ser | Lys | Cys | Asp | Gly | Met | Asn | Gly | Trp | Glu | Val | Ala |
|     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |
| Gly | Asp | His | Ile | Gln | Ser | Gly | Ala | Gly | Gly | Ser | Asp | Asn | Asp | Tyr | Leu |
| 305 |     |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     | 320 |
| Ile | Leu | Asn | Leu | His | Ile | Pro | Gly | Phe | Lys | Pro | Pro | Thr | Ser | Met | Thr |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Gly | Ala | Thr | Gly | Ser | Glu | Leu | Gly | Arg | Ile | Thr | Phe | Val | Phe | Glu | Thr |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Leu | Cys | Ser | Ala | Asp | Cys | Val | Leu | Tyr | Phe | Met | Val | Asp | Ile | Asn | Arg |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Lys | Ser | Thr | Asn | Val | Val | Glu | Ser | Trp | Gly | Gly | Thr | Lys | Glu | Lys | Gln |
|     |     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |
| Ala | Tyr | Thr | His | Ile | Ile | Phe | Lys | Asn | Ala | Thr | Phe | Thr | Phe | Thr | Trp |
| 385 |     |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     | 400 |
| Gly | Ile | Pro | Arg | Glu | Leu | Ile | Gln | Gly | Pro | Arg |     |     |     |     |     |
|     |     |     | 405 |     |     |     |     | 410 |     |     |     |     |     |     |     |

<210> 11  
 <211> 2155  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (166)..(1935)

<400> 11  
 cggcccttct cacactcctg ccctgctgat gtggaacggg gtttgggggt ctgcagggct 60  
 attgtctgcg ctggggaagg ggacaggccg ggaccgggac ctccgctcgc agccggccgc 120  
 accagcagga cagctggcct gaagctcaga gccggggcgt gcgcc atg gcc cca cac 177  
 Met Ala Pro His  
 1

tgg gct gtc tgg ctg ctg gca gca agg ctg tgg ggc ctg ggc att ggg 225  
 Trp Ala Val Trp Leu Leu Ala Ala Arg Leu Trp Gly Leu Gly Ile Gly  
 5 10 15 20  
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 Ala Glu Val Trp Trp Asn Leu Val Pro Arg Lys Thr Val Ser Ser Gly

| 25  |     |     |     |     |     |     |     |     |     | 30  |     |     |     |     | 35  |     |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| gag | ctg | gcc | acg | gta | gta | cgg | cgg | ttc | tcc | cag | acc | ggc | atc | cag | gac | 321 |  |  |  |  |
| Glu | Leu | Ala | Thr | Val | Val | Arg | Arg | Phe | Ser | Gln | Thr | Gly | Ile | Gln | Asp |     |  |  |  |  |
|     |     |     | 40  |     |     | 45  |     |     |     |     |     | 50  |     |     |     |     |  |  |  |  |
| ttc | ctg | aca | ctg | acg | ctg | acg | gag | ccc | act | ggg | ctt | ctg | tac | gtg | ggc | 369 |  |  |  |  |
| Phe | Leu | Thr | Leu | Thr | Leu | Thr | Glu | Pro | Thr | Gly | Leu | Leu | Tyr | Val | Gly |     |  |  |  |  |
|     |     |     | 55  |     |     | 60  |     |     |     |     |     | 65  |     |     |     |     |  |  |  |  |
| gcc | cga | gag | gcc | ctg | ttt | gcc | ttc | agc | atg | gag | gcc | ctg | gag | ctg | caa | 417 |  |  |  |  |
| Ala | Arg | Glu | Ala | Leu | Phe | Ala | Phe | Ser | Met | Glu | Ala | Leu | Glu | Leu | Gln |     |  |  |  |  |
|     |     |     | 70  |     |     | 75  |     |     |     |     |     | 80  |     |     |     |     |  |  |  |  |
| gga | gcg | atc | tcc | tgg | gag | gcc | ccc | gtg | gag | aag | aag | act | gag | tgt | atc | 465 |  |  |  |  |
| Gly | Ala | Ile | Ser | Trp | Glu | Ala | Pro | Val | Glu | Lys | Lys | Thr | Glu | Cys | Ile |     |  |  |  |  |
| 85  |     |     |     | 90  |     |     |     | 95  |     |     |     |     |     | 100 |     |     |  |  |  |  |
| cag | aaa | ggg | aag | aac | aac | cag | acc | gag | tgc | ttc | aac | ttc | atc | cgc | ttc | 513 |  |  |  |  |
| Gln | Lys | Gly | Lys | Asn | Asn | Gln | Thr | Glu | Cys | Phe | Asn | Phe | Ile | Arg | Phe |     |  |  |  |  |
|     |     |     | 105 |     |     |     |     |     | 110 |     |     |     |     |     | 115 |     |  |  |  |  |
| ctg | cag | ccc | tac | aat | gcc | tcc | cac | ctg | tac | gtc | tgt | ggc | acc | tac | gcc | 561 |  |  |  |  |
| Leu | Gln | Pro | Tyr | Asn | Ala | Ser | His | Leu | Tyr | Val | Cys | Gly | Thr | Tyr | Ala |     |  |  |  |  |
|     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |     |     | 130 |     |  |  |  |  |
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| Phe | Gln | Pro | Lys | Cys | Thr | Tyr | Val | Asn | Met | Leu | Thr | Phe | Thr | Leu | Glu |     |  |  |  |  |
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| cat | gga | gag | ttt | gaa | gat | ggg | aag | ggc | aag | tgt | ccc | tat | gac | cca | gct | 657 |  |  |  |  |
| His | Gly | Glu | Phe | Glu | Asp | Gly | Lys | Gly | Lys | Cys | Pro | Tyr | Asp | Pro | Ala |     |  |  |  |  |
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| Lys | Gly | His | Ala | Gly | Leu | Leu | Val | Asp | Gly | Glu | Leu | Tyr | Ser | Ala | Thr |     |  |  |  |  |
| 165 |     |     |     | 170 |     |     |     |     |     | 175 |     |     |     | 180 |     |     |  |  |  |  |
| ctc | aac | aac | ttc | ctg | ggc | acg | gaa | ccc | att | atc | ctg | cgt | aac | atg | ggg | 753 |  |  |  |  |
| Leu | Asn | Asn | Phe | Leu | Gly | Thr | Glu | Pro | Ile | Ile | Leu | Arg | Asn | Met | Gly |     |  |  |  |  |
|     |     |     | 185 |     |     |     |     |     | 190 |     |     |     |     |     | 195 |     |  |  |  |  |
| ccc | cac | cac | tcc | atg | aag | aca | gag | tac | ctg | gcc | ttt | tgg | ctc | aac | gaa | 801 |  |  |  |  |
| Pro | His | His | Ser | Met | Lys | Thr | Glu | Tyr | Leu | Ala | Phe | Trp | Leu | Asn | Glu |     |  |  |  |  |
|     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |     |     | 210 |     |  |  |  |  |
| cct | cac | ttt | gta | ggc | tct | gcc | tat | gta | cct | gag | agt | gtg | ggc | agc | ttc | 849 |  |  |  |  |
| Pro | His | Phe | Val | Gly | Ser | Ala | Tyr | Val | Pro | Glu | Ser | Val | Gly | Ser | Phe |     |  |  |  |  |
|     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |     | 225 |     |  |  |  |  |
| acg | ggg | gac | gac | gac | aag | gtc | tac | ttc | ttc | ttc | agg | gag | cgg | gca | gtg | 897 |  |  |  |  |
| Thr | Gly | Asp | Asp | Asp | Lys | Val | Tyr | Phe | Phe | Phe | Arg | Glu | Arg | Ala | Val |     |  |  |  |  |
| 230 |     |     |     |     |     | 235 |     |     |     |     |     | 240 |     |     |     |     |  |  |  |  |
| gag | tcc | gac | tgc | tat | gcc | gag | cag | gtg | gtg | gct | cgt | gtg | gcc | cgt | gtc | 945 |  |  |  |  |
| Glu | Ser | Asp | Cys | Tyr | Ala | Glu | Gln | Val | Val | Ala | Arg | Val | Ala | Arg | Val |     |  |  |  |  |
| 245 |     |     |     | 250 |     |     |     |     |     | 255 |     |     |     | 260 |     |     |  |  |  |  |

|   |      |
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| Cys Lys Gly Asp Met Gly Gly Ala Arg Thr Leu Gln Arg Lys Trp Thr |      |
| 265 270 275   |      |
| acg ttc ctg aag gcg cgg ctg gca tgc tct gcc ccg aac tgg cag ctc | 1041 |
| Thr Phe Leu Lys Ala Arg Leu Ala Cys Ser Ala Pro Asn Trp Gln Leu |      |
| 280 285 290   |      |
| tac ttc aac cag ctg cag gcg atg cac acc ctg cag gac acc tcc tgg | 1089 |
| Tyr Phe Asn Gln Leu Gln Ala Met His Thr Leu Gln Asp Thr Ser Trp |      |
| 295 300 305   |      |
| cac aac acc acc ttc ttt ggg gtt ttt caa gca cag tgg ggt gac atg | 1137 |
| His Asn Thr Thr Phe Phe Gly Val Phe Gln Ala Gln Trp Gly Asp Met |      |
| 310 315 320   |      |
| tac ctg tgc gcc atc tgt gag tac cag ttg gaa gag atc cag cgg gtg | 1185 |
| Tyr Leu Ser Ala Ile Cys Glu Tyr Gln Leu Glu Glu Ile Gln Arg Val |      |
| 325 330 335 340   |      |
| ttt gag ggc ccc tat aag gag tac cat gag gaa gcc cag aag tgg gac | 1233 |
| Phe Glu Gly Pro Tyr Lys Glu Tyr His Glu Glu Ala Gln Lys Trp Asp |      |
| 345 350 355   |      |
| cgc tac act gac cct gta ccc agc cct cgg cct ggc tgc tgc att aac | 1281 |
| Arg Tyr Thr Asp Pro Val Pro Ser Pro Arg Pro Gly Ser Cys Ile Asn |      |
| 360 365 370   |      |
| aac tgg cat cgg cgc cac ggc tac acc agc tcc ctg gag cta ccc gac | 1329 |
| Asn Trp His Arg Arg His Gly Tyr Thr Ser Ser Leu Glu Leu Pro Asp |      |
| 375 380 385   |      |
| aac atc ctc aac ttc gtc aag aag cac ccg ctg atg gag gag cag gtg | 1377 |
| Asn Ile Leu Asn Phe Val Lys Lys His Pro Leu Met Glu Glu Gln Val |      |
| 390 395 400   |      |
| ggg cct cgg tgg agc cgc ccc ctg ctc gtg aag aag ggc acc aac ttc | 1425 |
| Gly Pro Arg Trp Ser Arg Pro Leu Leu Val Lys Lys Gly Thr Asn Phe |      |
| 405 410 415 420   |      |
| acc cac ctg gtg gcc gac cgg gtt aca gga ctt gat gga gcc acc tat | 1473 |
| Thr His Leu Val Ala Asp Arg Val Thr Gly Leu Asp Gly Ala Thr Tyr |      |
| 425 430 435   |      |
| aca gtg ctg ttc att ggc aca gga gac ggc tgg ctg ctc aag gct gtg | 1521 |
| Thr Val Leu Phe Ile Gly Thr Gly Asp Gly Trp Leu Leu Lys Ala Val |      |
| 440 445 450   |      |
| agc ctg ggg ccc tgg gtt cac ctg att gag gag ctg cag ctg ttt gac | 1569 |
| Ser Leu Gly Pro Trp Val His Leu Ile Glu Glu Leu Gln Leu Phe Asp |      |
| 455 460 465   |      |
| cag gag ccc atg aga agc ctg gtg cta tct cag agc aag aag ctg ctc | 1617 |
| Gln Glu Pro Met Arg Ser Leu Val Leu Ser Gln Ser Lys Lys Leu Leu |      |
| 470 475 480   |      |

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 485 490 495 500  
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 Ile Lys Tyr Arg Ser Cys Ala Asp Cys Val Leu Ala Arg Asp Pro Tyr  
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 Cys Ala Trp Ser Val Asn Thr Ser Arg Cys Val Ala Val Gly Gly His  
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 Phe Gly Ser Leu Leu Ile Gln His Val Met Thr Ser Asp Thr Ser Gly  
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 Ile Cys Asn Leu Arg Gly Ser Lys Lys Val Arg Pro Thr Pro Lys Asn  
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 Val Ser Ser Gly Glu Leu Ala Thr Val Val Arg Arg Phe Ser Gln Thr  
 35 40 45  
 Gly Ile Gln Asp Phe Leu Thr Leu Thr Leu Thr Glu Pro Thr Gly Leu  
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 Leu Tyr Val Gly Ala Arg Glu Ala Leu Phe Ala Phe Ser Met Glu Ala  
 65 70 75 80

Leu Glu Leu Gln Gly Ala Ile Ser Trp Glu Ala Pro Val Glu Lys Lys  
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 Thr Glu Cys Ile Gln Lys Gly Lys Asn Asn Gln Thr Glu Cys Phe Asn  
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 Phe Ile Arg Phe Leu Gln Pro Tyr Asn Ala Ser His Leu Tyr Val Cys  
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 Gly Thr Tyr Ala Phe Gln Pro Lys Cys Thr Tyr Val Asn Met Leu Thr  
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 Tyr Asp Pro Ala Lys Gly His Ala Gly Leu Leu Val Asp Gly Glu Leu  
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 Tyr Ser Ala Thr Leu Asn Asn Phe Leu Gly Thr Glu Pro Ile Ile Leu  
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 Arg Asn Met Gly Pro His His Ser Met Lys Thr Glu Tyr Leu Ala Phe  
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 Trp Leu Asn Glu Pro His Phe Val Gly Ser Ala Tyr Val Pro Glu Ser  
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 Val Gly Ser Phe Thr Gly Asp Asp Asp Lys Val Tyr Phe Phe Phe Arg  
                                     225                                    230                                    235                                    240  
 Glu Arg Ala Val Glu Ser Asp Cys Tyr Ala Glu Gln Val Val Ala Arg  
                                     245                                    250                                    255  
 Val Ala Arg Val Cys Lys Gly Asp Met Gly Gly Ala Arg Thr Leu Gln  
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 Arg Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ala Cys Ser Ala Pro  
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 Asn Trp Gln Leu Tyr Phe Asn Gln Leu Gln Ala Met His Thr Leu Gln  
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 Trp Gly Asp Met Tyr Leu Ser Ala Ile Cys Glu Tyr Gln Leu Glu Glu  
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 Ile Gln Arg Val Phe Glu Gly Pro Tyr Lys Glu Tyr His Glu Glu Ala  
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 Gln Lys Trp Asp Arg Tyr Thr Asp Pro Val Pro Ser Pro Arg Pro Gly  
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 Ser Cys Ile Asn Asn Trp His Arg Arg His Gly Tyr Thr Ser Ser Leu  
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Leu | Pro | Asp | Asn | Ile | Leu | Asn | Phe | Val | Lys | Lys | His | Pro | Leu | Met |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Glu | Glu | Gln | Val | Gly | Pro | Arg | Trp | Ser | Arg | Pro | Leu | Leu | Val | Lys | Lys |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Gly | Thr | Asn | Phe | Thr | His | Leu | Val | Ala | Asp | Arg | Val | Thr | Gly | Leu | Asp |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Gly | Ala | Thr | Tyr | Thr | Val | Leu | Phe | Ile | Gly | Thr | Gly | Asp | Gly | Trp | Leu |
|     |     |     | 435 |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Leu | Lys | Ala | Val | Ser | Leu | Gly | Pro | Trp | Val | His | Leu | Ile | Glu | Glu | Leu |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Gln | Leu | Phe | Asp | Gln | Glu | Pro | Met | Arg | Ser | Leu | Val | Leu | Ser | Gln | Ser |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Lys | Lys | Leu | Leu | Phe | Ala | Gly | Ser | Arg | Ser | Gln | Leu | Val | Gln | Leu | Pro |
|     |     |     |     | 485 |     |     |     | 490 |     |     |     |     |     | 495 |     |
| Val | Ala | Asp | Cys | Ile | Lys | Tyr | Arg | Ser | Cys | Ala | Asp | Cys | Val | Leu | Ala |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |
| Arg | Asp | Pro | Tyr | Cys | Ala | Trp | Ser | Val | Asn | Thr | Ser | Arg | Cys | Val | Ala |
|     |     |     | 515 |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Val | Gly | Gly | His | Phe | Gly | Ser | Leu | Leu | Ile | Gln | His | Val | Met | Thr | Ser |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |
| Asp | Thr | Ser | Gly | Ile | Cys | Asn | Leu | Arg | Gly | Ser | Lys | Lys | Val | Arg | Pro |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |
| Thr | Pro | Lys | Asn | Ile | Thr | Val | Val | Ala | Gly | Thr | Asp | Leu | Val | Leu | Pro |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |
| Cys | His | Leu | Ser | Ser | Thr | Trp | Pro | Arg | Gly | Ser | Val | Val | Phe |     |     |
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accagcagga cagctggcct gaagctcaga gccggggcgt gcgcc atg gcc cca cac 177  
Met Ala Pro His

1

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Trp Ala Val Trp Leu Leu Ala Ala Arg Leu Trp Gly Leu Gly Ile Gly  
5 10 15 20

gct gag gtg tgg tgg aac ctt gtg ccg cgt aag aca gtg tct tct ggg 273  
Ala Glu Val Trp Trp Asn Leu Val Pro Arg Lys Thr Val Ser Ser Gly  
25 30 35

gag ctg gcc acg gta gta cgg cgg ttc tcc cag acc ggc atc cag gac 321  
Glu Leu Ala Thr Val Val Arg Arg Phe Ser Gln Thr Gly Ile Gln Asp  
40 45 50

ttc ctg aca ctg acg ctg acg gag ccc act ggg ctt ctg tac gtg ggc 369  
Phe Leu Thr Leu Thr Leu Thr Glu Pro Thr Gly Leu Leu Tyr Val Gly  
55 60 65

gcc cga gag gcc ctg ttt gcc ttc agc atg gag gcc ctg gag ctg caa 417  
Ala Arg Glu Ala Leu Phe Ala Phe Ser Met Glu Ala Leu Glu Leu Gln  
70 75 80

gga gcg atc tcc tgg gag gcc ccc gtg gag aag aag act gag tgt atc 465  
Gly Ala Ile Ser Trp Glu Ala Pro Val Glu Lys Lys Thr Glu Cys Ile  
85 90 95 100

cag aaa ggg aag aac aac cag acc gag tgc ttc aac ttc atc cgc ttc 513  
Gln Lys Gly Lys Asn Asn Gln Thr Glu Cys Phe Asn Phe Ile Arg Phe  
105 110 115

ctg cag ccc tac aat gcc tcc cac ctg tac gtc tgt ggc acc tac gcc 561  
Leu Gln Pro Tyr Asn Ala Ser His Leu Tyr Val Cys Gly Thr Tyr Ala  
120 125 130

ttc cag ccc aag tgc acc tac gtc aac atg ctc acc ttc act ttg gag 609  
Phe Gln Pro Lys Cys Thr Tyr Val Asn Met Leu Thr Phe Thr Leu Glu  
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cat gga gag ttt gaa gat ggg aag ggc aag tgt ccc tat gac cca gct 657  
His Gly Glu Phe Glu Asp Gly Lys Gly Lys Cys Pro Tyr Asp Pro Ala  
150 155 160

aag ggc cat gct ggc ctt ctt gtg gat ggt gag ctg tac tcg gcc aca 705  
Lys Gly His Ala Gly Leu Leu Val Asp Gly Glu Leu Tyr Ser Ala Thr  
165 170 175 180

ctc aac aac ttc ctg ggc acg gaa ccc att atc ctg cgt aac atg ggg 753  
Leu Asn Asn Phe Leu Gly Thr Glu Pro Ile Ile Leu Arg Asn Met Gly  
185 190 195

ccc cac cac tcc atg aag aca gag tac ctg gcc ttt tgg ctc aac gaa 801  
Pro His His Ser Met Lys Thr Glu Tyr Leu Ala Phe Trp Leu Asn Glu

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| acg ggg gac gac gac aag gtc tac ttc ttc ttc agg gag cgg gca gtg<br>Thr Gly Asp Asp Asp Lys Val Tyr Phe Phe Phe Arg Glu Arg Ala Val<br>230 235 240     |     |     | 897  |
| gag tcc gac tgc tat gcc gag cag gtg gtg gct cgt gtg gcc cgt gtc<br>Glu Ser Asp Cys Tyr Ala Glu Gln Val Val Ala Arg Val Ala Arg Val<br>245 250 255 260 |     |     | 945  |
| tgc aag ggc gat atg ggg ggc gca cgg acc ctg cag agg aag tgg acc<br>Cys Lys Gly Asp Met Gly Gly Ala Arg Thr Leu Gln Arg Lys Trp Thr<br>265 270 275     |     |     | 993  |
| acg ttc ctg aag gcg cgg ctg gca tgc tct gcc ccg aac tgg cag ctc<br>Thr Phe Leu Lys Ala Arg Leu Ala Cys Ser Ala Pro Asn Trp Gln Leu<br>280 285 290     |     |     | 1041 |
| tac ttc aac cag ctg cag gcg atg cac acc ctg cag gac acc tcc tgg<br>Tyr Phe Asn Gln Leu Gln Ala Met His Thr Leu Gln Asp Thr Ser Trp<br>295 300 305     |     |     | 1089 |
| cac aac acc acc ttc ttt ggg gtt ttt caa gca cag tgg ggt gac atg<br>His Asn Thr Thr Phe Phe Gly Val Phe Gln Ala Gln Trp Gly Asp Met<br>310 315 320     |     |     | 1137 |
| tac ctg tcg gcc atc tgt gag tac cag ttg gaa gag atc cag cgg gtg<br>Tyr Leu Ser Ala Ile Cys Glu Tyr Gln Leu Glu Glu Ile Gln Arg Val<br>325 330 335 340 |     |     | 1185 |
| ttt gag ggc ccc tat aag gag tac cat gag gaa gcc cag aag tgg gac<br>Phe Glu Gly Pro Tyr Lys Glu Tyr His Glu Glu Ala Gln Lys Trp Asp<br>345 350 355     |     |     | 1233 |
| cgc tac act gac cct gta ccc agc cct cgg cct ggc tcg tgc att aac<br>Arg Tyr Thr Asp Pro Val Pro Ser Pro Arg Pro Gly Ser Cys Ile Asn<br>360 365 370     |     |     | 1281 |
| aac tgg cat cgg cgc cac ggc tac acc agc tcc ctg gag cta ccc gac<br>Asn Trp His Arg Arg His Gly Tyr Thr Ser Ser Leu Glu Leu Pro Asp<br>375 380 385     |     |     | 1329 |
| aac atc ctc aac ttc gtc aag aag cac ccg ctg atg gag gag cag gtg<br>Asn Ile Leu Asn Phe Val Lys Lys His Pro Leu Met Glu Glu Gln Val<br>390 395 400     |     |     | 1377 |
| ggg cct cgg tgg agc cgc ccc ctg ctc gtg aag aag ggc acc aac ttc<br>Gly Pro Arg Trp Ser Arg Pro Leu Leu Val Lys Lys Gly Thr Asn Phe<br>405 410 415 420 |     |     | 1425 |
| acc cac ctg gtg gcc gac cgg gtt aca gga ctt gat gga gcc acc tat<br>Thr His Leu Val Ala Asp Arg Val Thr Gly Leu Asp Gly Ala Thr Tyr<br>425 430 435     |     |     | 1473 |

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 Thr Val Leu Phe Ile Gly Thr Gly Asp Gly Trp Leu Leu Lys Ala Val  
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 agc ctg ggg ccc tgg gtt cac ctg att gag gag ctg cag ctg ttt gac 1569  
 Ser Leu Gly Pro Trp Val His Leu Ile Glu Glu Leu Gln Leu Phe Asp  
 455 460 465  
 cag gag ccc atg aga agc ctg gtg cta tct cag agc aag aag ctg ctc 1617  
 Gln Glu Pro Met Arg Ser Leu Val Leu Ser Gln Ser Lys Lys Leu Leu  
 470 475 480  
 ttt gcc ggc tcc cgc tct cag ctg gtg cag ctg ccc gtg gcc gac tgc 1665  
 Phe Ala Gly Ser Arg Ser Gln Leu Val Gln Leu Pro Val Ala Asp Cys  
 485 490 495 500  
 ata aag tat cgc tcc tgt gca gac tgt gtc ctc gcc cgg gac ccc tat 1713  
 Ile Lys Tyr Arg Ser Cys Ala Asp Cys Val Leu Ala Arg Asp Pro Tyr  
 505 510 515  
 tgc gcc tgg agc gtc aac acc agc cgc tgt gtg gcc gtg ggt ggc cac 1761  
 Cys Ala Trp Ser Val Asn Thr Ser Arg Cys Val Ala Val Gly Gly His  
 520 525 530  
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 Phe Gly Ser Leu Leu Ile Gln His Val Met Thr Ser Asp Thr Ser Gly  
 535 540 545  
 att tgc aac ctc cgt ggc agt aag ata cag tca ggc cca ctn ccc aaa 1857  
 Ile Cys Asn Leu Arg Gly Ser Lys Ile Gln Ser Gly Pro Xaa Pro Lys  
 550 555 560  
 aac atc acg gtg gtg gcg ggc aca gac ctg gtg ctg ccc tgc cac ctc 1905  
 Asn Ile Thr Val Val Ala Gly Thr Asp Leu Val Leu Pro Cys His Leu  
 565 570 575 580  
 tcc tcc aac ttg gcc ctg ccc gac tcc aac ccc gag gag tca tca gta 1953  
 Ser Ser Asn Leu Ala Leu Pro Asp Ser Asn Pro Glu Glu Ser Ser Val  
 585 590 595  
 tgaggggaac cccaccgcg tcggcggana gcgtgggagg tgtagctcct acttttgcac 2013  
 aggcaccagc tatctcaggg acatggcacg ggcacctgct ctgtctggga cagatactgc 2073  
 ccagcaccaca ccggccatg aggacctgct ctgctcagca cgggcactgc acttggtgtg 2133  
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Val Ser Ser Gly Glu Leu Ala Thr Val Val Arg Arg Phe Ser Gln Thr  
35 40 45

Gly Ile Gln Asp Phe Leu Thr Leu Thr Leu Thr Glu Pro Thr Gly Leu  
50 55 60

Leu Tyr Val Gly Ala Arg Glu Ala Leu Phe Ala Phe Ser Met Glu Ala  
65 70 75 80

Leu Glu Leu Gln Gly Ala Ile Ser Trp Glu Ala Pro Val Glu Lys Lys  
85 90 95

Thr Glu Cys Ile Gln Lys Gly Lys Asn Asn Gln Thr Glu Cys Phe Asn  
100 105 110

Phe Ile Arg Phe Leu Gln Pro Tyr Asn Ala Ser His Leu Tyr Val Cys  
115 120 125

Gly Thr Tyr Ala Phe Gln Pro Lys Cys Thr Tyr Val Asn Met Leu Thr  
130 135 140

Phe Thr Leu Glu His Gly Glu Phe Glu Asp Gly Lys Gly Lys Cys Pro  
145 150 155 160

Tyr Asp Pro Ala Lys Gly His Ala Gly Leu Leu Val Asp Gly Glu Leu  
165 170 175

Tyr Ser Ala Thr Leu Asn Asn Phe Leu Gly Thr Glu Pro Ile Ile Leu  
180 185 190

Arg Asn Met Gly Pro His His Ser Met Lys Thr Glu Tyr Leu Ala Phe  
195 200 205

Trp Leu Asn Glu Pro His Phe Val Gly Ser Ala Tyr Val Pro Glu Ser  
210 215 220

Val Gly Ser Phe Thr Gly Asp Asp Asp Lys Val Tyr Phe Phe Phe Arg  
225 230 235 240

Glu Arg Ala Val Glu Ser Asp Cys Tyr Ala Glu Gln Val Val Ala Arg  
245 250 255

Val Ala Arg Val Cys Lys Gly Asp Met Gly Gly Ala Arg Thr Leu Gln

| 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Lys | Trp | Thr | Thr | Phe | Leu | Lys | Ala | Arg | Leu | Ala | Cys | Ser | Ala | Pro |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Asn | Trp | Gln | Leu | Tyr | Phe | Asn | Gln | Leu | Gln | Ala | Met | His | Thr | Leu | Gln |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Asp | Thr | Ser | Trp | His | Asn | Thr | Thr | Phe | Phe | Gly | Val | Phe | Gln | Ala | Gln |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Trp | Gly | Asp | Met | Tyr | Leu | Ser | Ala | Ile | Cys | Glu | Tyr | Gln | Leu | Glu | Glu |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Ile | Gln | Arg | Val | Phe | Glu | Gly | Pro | Tyr | Lys | Glu | Tyr | His | Glu | Glu | Ala |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Gln | Lys | Trp | Asp | Arg | Tyr | Thr | Asp | Pro | Val | Pro | Ser | Pro | Arg | Pro | Gly |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Ser | Cys | Ile | Asn | Asn | Trp | His | Arg | Arg | His | Gly | Tyr | Thr | Ser | Ser | Leu |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Glu | Leu | Pro | Asp | Asn | Ile | Leu | Asn | Phe | Val | Lys | Lys | His | Pro | Leu | Met |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Glu | Glu | Gln | Val | Gly | Pro | Arg | Trp | Ser | Arg | Pro | Leu | Leu | Val | Lys | Lys |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Gly | Thr | Asn | Phe | Thr | His | Leu | Val | Ala | Asp | Arg | Val | Thr | Gly | Leu | Asp |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Gly | Ala | Thr | Tyr | Thr | Val | Leu | Phe | Ile | Gly | Thr | Gly | Asp | Gly | Trp | Leu |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Leu | Lys | Ala | Val | Ser | Leu | Gly | Pro | Trp | Val | His | Leu | Ile | Glu | Glu | Leu |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Gln | Leu | Phe | Asp | Gln | Glu | Pro | Met | Arg | Ser | Leu | Val | Leu | Ser | Gln | Ser |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Lys | Lys | Leu | Leu | Phe | Ala | Gly | Ser | Arg | Ser | Gln | Leu | Val | Gln | Leu | Pro |
|     |     |     |     | 485 |     |     |     | 490 |     |     |     |     | 495 |     |     |
| Val | Ala | Asp | Cys | Ile | Lys | Tyr | Arg | Ser | Cys | Ala | Asp | Cys | Val | Leu | Ala |
|     |     | 500 |     |     |     |     |     | 505 |     |     |     |     | 510 |     |     |
| Arg | Asp | Pro | Tyr | Cys | Ala | Trp | Ser | Val | Asn | Thr | Ser | Arg | Cys | Val | Ala |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Val | Gly | Gly | His | Phe | Gly | Ser | Leu | Leu | Ile | Gln | His | Val | Met | Thr | Ser |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |
| Asp | Thr | Ser | Gly | Ile | Cys | Asn | Leu | Arg | Gly | Ser | Lys | Ile | Gln | Ser | Gly |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |
| Pro | Xaa | Pro | Lys | Asn | Ile | Thr | Val | Val | Ala | Gly | Thr | Asp | Leu | Val | Leu |

565 570 575

Pro Cys His Leu Ser Ser Asn Leu Ala Leu Pro Asp Ser Asn Pro Glu  
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Glu Ser Ser Val  
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ccggaccccc tctgtcttct gctagac atg ctc ttc ctc tcg ttt cat gca ggc 174  
Met Leu Phe Leu Ser Phe His Ala Gly  
1 5

tct tgg gaa agc tgg tgc tgc tgc tgc ctg att ccc gcc gac aga cct 222  
Ser Trp Glu Ser Trp Cys Cys Cys Cys Leu Ile Pro Ala Asp Arg Pro  
10 15 20 25

tgg gac cgg ggc caa cac tgg cag ctg gag atg gcg gac acg aga tcc 270  
Trp Asp Arg Gly Gln His Trp Gln Leu Glu Met Ala Asp Thr Arg Ser  
30 35 40

gtg cac gag act agg ttt gag gcg gcc gtg aag gtg atc cag agt ttg 318  
Val His Glu Thr Arg Phe Glu Ala Ala Val Lys Val Ile Gln Ser Leu  
45 50 55

ccg aag aat ggt tca ttc cag cca aca aat gaa atg atg ctt aaa ttt 366  
Pro Lys Asn Gly Ser Phe Gln Pro Thr Asn Glu Met Met Leu Lys Phe  
60 65 70

tat agc ttc tat aag cag gca act gaa gga ccc tgt aaa ctt tca agg 414  
Tyr Ser Phe Tyr Lys Gln Ala Thr Glu Gly Pro Cys Lys Leu Ser Arg  
75 80 85

cct gga ttt tgg gat cct att gga aga tat aaa tgg gat gct tgg agt 462  
Pro Gly Phe Trp Asp Pro Ile Gly Arg Tyr Lys Trp Asp Ala Trp Ser  
90 95 100 105

tca ctg ggt gat atg acc aaa gag gaa gcc atg att gca tat gtt gaa 510

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Ser | Leu | Gly | Asp | Met | Thr | Lys | Glu | Glu | Ala | Met | Ile | Ala | Tyr | Val | Glu |      |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |     |      |  |
| gaa | atg | aaa | aag | att | att | gaa | act | atg | cca | atg | act | gag | aaa | gtt | gaa | 558  |  |
| Glu | Met | Lys | Lys | Ile | Ile | Glu | Thr | Met | Pro | Met | Thr | Glu | Lys | Val | Glu |      |  |
|     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |     |     |      |  |
| gaa | ttg | ctg | cgt | gtc | ata | ggg | cca | ttt | tat | gaa | att | gtc | gag | gac | aaa | 606  |  |
| Glu | Leu | Leu | Arg | Val | Ile | Gly | Pro | Phe | Tyr | Glu | Ile | Val | Glu | Asp | Lys |      |  |
|     |     |     | 140 |     |     |     | 145 |     |     |     |     | 150 |     |     |     |      |  |
| aag | agt | ggc | agg | agt | tct | gat | ata | acc | tca | gtc | cga | ctg | gag | aaa | atc | 654  |  |
| Lys | Ser | Gly | Arg | Ser | Ser | Asp | Ile | Thr | Ser | Val | Arg | Leu | Glu | Lys | Ile |      |  |
|     |     |     | 155 |     |     | 160 |     |     |     |     | 165 |     |     |     |     |      |  |
| tct | aaa | tgt | tta | gaa | gat | ctt | ggg | aat | gtt | ctc | act | tct | act | cca | aac | 702  |  |
| Ser | Lys | Cys | Leu | Glu | Asp | Leu | Gly | Asn | Val | Leu | Thr | Ser | Thr | Pro | Asn |      |  |
| 170 |     |     |     |     | 175 |     |     |     |     | 180 |     |     |     |     | 185 |      |  |
| gcc | aaa | acc | gtt | aat | ggg | aaa | gct | gaa | agc | agt | gac | agt | gga | gcc | gag | 750  |  |
| Ala | Lys | Thr | Val | Asn | Gly | Lys | Ala | Glu | Ser | Ser | Asp | Ser | Gly | Ala | Glu |      |  |
|     |     |     |     | 190 |     |     |     |     | 195 |     |     |     |     | 200 |     |      |  |
| tct | gag | gaa | gaa | gag | gcc | caa | gaa | gaa | gtg | aaa | gga | gca | gaa | caa | agt | 798  |  |
| Ser | Glu | Glu | Glu | Glu | Ala | Gln | Glu | Glu | Val | Lys | Gly | Ala | Glu | Gln | Ser |      |  |
|     |     |     |     | 205 |     |     |     | 210 |     |     |     |     | 215 |     |     |      |  |
| gat | aat | gat | aag | aaa | atg | atg | aag | aag | tca | gca | gac | cat | aag | aat | ttg | 846  |  |
| Asp | Asn | Asp | Lys | Lys | Met | Met | Lys | Lys | Ser | Ala | Asp | His | Lys | Asn | Leu |      |  |
|     |     |     | 220 |     |     |     | 225 |     |     |     |     | 230 |     |     |     |      |  |
| gaa | gtc | att | gtc | act | aat | ggc | tat | gat | aaa | gat | ggc | ttt | gtt | cag | gat | 894  |  |
| Glu | Val | Ile | Val | Thr | Asn | Gly | Tyr | Asp | Lys | Asp | Gly | Phe | Val | Gln | Asp |      |  |
|     | 235 |     |     |     |     | 240 |     |     |     |     | 245 |     |     |     |     |      |  |
| ata | cag | aat | gac | att | cat | gcc | agt | tct | tcc | ctg | aat | ggc | aga | agc | act | 942  |  |
| Ile | Gln | Asn | Asp | Ile | His | Ala | Ser | Ser | Ser | Leu | Asn | Gly | Arg | Ser | Thr |      |  |
|     | 250 |     |     |     | 255 |     |     |     |     | 260 |     |     |     |     | 265 |      |  |
| gaa | gaa | gta | aag | ccc | att | gat | gaa | aac | ttg | ggg | caa | act | gga | aaa | tct | 990  |  |
| Glu | Glu | Val | Lys | Pro | Ile | Asp | Glu | Asn | Leu | Gly | Gln | Thr | Gly | Lys | Ser |      |  |
|     |     |     |     | 270 |     |     |     | 275 |     |     |     |     |     | 280 |     |      |  |
| gct | gtt | tgc | att | cac | caa | gat | ata | aat | gat | gat | cat | gtt | gaa | gat | gtt | 1038 |  |
| Ala | Val | Cys | Ile | His | Gln | Asp | Ile | Asn | Asp | Asp | His | Val | Glu | Asp | Val |      |  |
|     |     |     | 285 |     |     |     |     | 290 |     |     |     |     | 295 |     |     |      |  |
| aca | gga | att | cag | cat | ttg | aca | agc | gat | tca | gac | agt | gaa | gtt | tac | tgt | 1086 |  |
| Thr | Gly | Ile | Gln | His | Leu | Thr | Ser | Asp | Ser | Asp | Ser | Glu | Val | Tyr | Cys |      |  |
|     |     |     | 300 |     |     |     | 305 |     |     |     |     | 310 |     |     |     |      |  |
| gat | tct | atg | gaa | caa | ttt | gga | caa | gaa | gag | tct | tta | gac | agc | ttt | acg | 1134 |  |
| Asp | Ser | Met | Glu | Gln | Phe | Gly | Gln | Glu | Glu | Ser | Leu | Asp | Ser | Phe | Thr |      |  |
|     |     |     | 315 |     |     | 320 |     |     |     |     | 325 |     |     |     |     |      |  |
| tcc | aac | aat | gga | cca | ttt | cag | tat | tac | ttg | ggg | ggg | cat | tcc | agt | caa | 1182 |  |
| Ser | Asn | Asn | Gly | Pro | Phe | Gln | Tyr | Tyr | Leu | Gly | Gly | His | Ser | Ser | Gln |      |  |



| 330   | 335 | 340 | 345 |      |
|---|-----|-----|-----|------|
| ccc atg gaa aat tct gga ttt cgt gaa gat att caa gta cct cct gga     |     |     |     | 1230 |
| Pro Met Glu Asn Ser Gly Phe Arg Glu Asp Ile Gln Val Pro Pro Gly     |     |     |     |      |
|   | 350 | 355 | 360 |      |
| aat ggc aac att ggg aat atg cag gtg gtt gca gtt gaa gga aaa ggt     |     |     |     | 1278 |
| Asn Gly Asn Ile Gly Asn Met Gln Val Val Ala Val Glu Gly Lys Gly     |     |     |     |      |
|   | 365 | 370 | 375 |      |
| gaa gtc aag cat gga gga gaa gat ggc agg aat aac agc gga gca cca     |     |     |     | 1326 |
| Glu Val Lys His Gly Gly Glu Asp Gly Arg Asn Asn Ser Gly Ala Pro     |     |     |     |      |
|   | 380 | 385 | 390 |      |
| cac cgg gag aag cga ggc gga gaa act gac gaa ttc tct aat gtt aga     |     |     |     | 1374 |
| His Arg Glu Lys Arg Gly Gly Glu Thr Asp Glu Phe Ser Asn Val Arg     |     |     |     |      |
|   | 395 | 400 | 405 |      |
| aga gga aga gga cat agg atg caa cac ttg agc gaa gga acc aag ggc     |     |     |     | 1422 |
| Arg Gly Arg Gly His Arg Met Gln His Leu Ser Glu Gly Thr Lys Gly     |     |     |     |      |
|   | 410 | 415 | 420 | 425  |
| cgg cag gtg gga agt gga ggt gat ggg gag cgc tgg ggc tcc gac aga     |     |     |     | 1470 |
| Arg Gln Val Gly Ser Gly Gly Asp Gly Glu Arg Trp Gly Ser Asp Arg     |     |     |     |      |
|   | 430 | 435 | 440 |      |
| ggg tcc cga ggc agc ctc aat gag cag atc gcc ctc gtg ctg atg aga     |     |     |     | 1518 |
| Gly Ser Arg Gly Ser Leu Asn Glu Gln Ile Ala Leu Val Leu Met Arg     |     |     |     |      |
|   | 445 | 450 | 455 |      |
| ctg cag gag gac atg cag aat gtc ctt cag aga ctg cag aaa ctg gaa     |     |     |     | 1566 |
| Leu Gln Glu Asp Met Gln Asn Val Leu Gln Arg Leu Gln Lys Leu Glu     |     |     |     |      |
|   | 460 | 465 | 470 |      |
| atg ctg act gct ttg cag gca aaa tca tca aca tca aca ttg cag act     |     |     |     | 1614 |
| Met Leu Thr Ala Leu Gln Ala Lys Ser Ser Thr Ser Thr Leu Gln Thr     |     |     |     |      |
|   | 475 | 480 | 485 |      |
| gct cct cag ccc acc tca cag aga cca tct tgg tgg ccc ttc gag atg     |     |     |     | 1662 |
| Ala Pro Gln Pro Thr Ser Gln Arg Pro Ser Trp Trp Pro Phe Glu Met     |     |     |     |      |
|   | 490 | 495 | 500 | 505  |
| tct cct ggt gtg cta acg ttt gcc atc ata tgg cct ttt att gca cag     |     |     |     | 1710 |
| Ser Pro Gly Val Leu Thr Phe Ala Ile Ile Trp Pro Phe Ile Ala Gln     |     |     |     |      |
|   | 510 | 515 | 520 |      |
| tgg ttg gtg tat tta tac tat caa aga agg aga aga aaa ctg aac         |     |     |     | 1755 |
| Trp Leu Val Tyr Leu Tyr Tyr Gln Arg Arg Arg Lys Leu Asn             |     |     |     |      |
|   | 525 | 530 | 535 |      |
| tgagggaaaaa tgggtgttttc ctcaagaaga ctactggaac tggatgacct cagaatgaac |     |     |     | 1815 |
| tggattgtgg tggtcacaag aaaatccttag tttgtgatga ttacattgct ttttgttgtc  |     |     |     | 1875 |
| cngtagttta gtttgtgtac atatatacac atatataattt tgcactacac aaacg       |     |     |     | 1930 |

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 <212> PRT  
 <213> Homo sapiens

<400> 16

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Phe | Leu | Ser | Phe | His | Ala | Gly | Ser | Trp | Glu | Ser | Trp | Cys | Cys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Cys | Cys | Leu | Ile | Pro | Ala | Asp | Arg | Pro | Trp | Asp | Arg | Gly | Gln | His | Trp |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Gln | Leu | Glu | Met | Ala | Asp | Thr | Arg | Ser | Val | His | Glu | Thr | Arg | Phe | Glu |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Ala | Ala | Val | Lys | Val | Ile | Gln | Ser | Leu | Pro | Lys | Asn | Gly | Ser | Phe | Gln |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Thr | Asn | Glu | Met | Met | Leu | Lys | Phe | Tyr | Ser | Phe | Tyr | Lys | Gln | Ala |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Thr | Glu | Gly | Pro | Cys | Lys | Leu | Ser | Arg | Pro | Gly | Phe | Trp | Asp | Pro | Ile |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gly | Arg | Tyr | Lys | Trp | Asp | Ala | Trp | Ser | Ser | Leu | Gly | Asp | Met | Thr | Lys |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Glu | Glu | Ala | Met | Ile | Ala | Tyr | Val | Glu | Glu | Met | Lys | Lys | Ile | Ile | Glu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr | Met | Pro | Met | Thr | Glu | Lys | Val | Glu | Glu | Leu | Leu | Arg | Val | Ile | Gly |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Pro | Phe | Tyr | Glu | Ile | Val | Glu | Asp | Lys | Lys | Ser | Gly | Arg | Ser | Ser | Asp |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Ile | Thr | Ser | Val | Arg | Leu | Glu | Lys | Ile | Ser | Lys | Cys | Leu | Glu | Asp | Leu |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Asn | Val | Leu | Thr | Ser | Thr | Pro | Asn | Ala | Lys | Thr | Val | Asn | Gly | Lys |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ala | Glu | Ser | Ser | Asp | Ser | Gly | Ala | Glu | Ser | Glu | Glu | Glu | Glu | Ala | Gln |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Glu | Glu | Val | Lys | Gly | Ala | Glu | Gln | Ser | Asp | Asn | Asp | Lys | Lys | Met | Met |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Lys | Lys | Ser | Ala | Asp | His | Lys | Asn | Leu | Glu | Val | Ile | Val | Thr | Asn | Gly |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Tyr | Asp | Lys | Asp | Gly | Phe | Val | Gln | Asp | Ile | Gln | Asn | Asp | Ile | His | Ala |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ser | Ser | Ser | Leu | Asn | Gly | Arg | Ser | Thr | Glu | Glu | Val | Lys | Pro | Ile | Asp |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |

Glu Asn Leu Gly Gln Thr Gly Lys Ser Ala Val Cys Ile His Gln Asp  
 275 280 285  
 Ile Asn Asp Asp His Val Glu Asp Val Thr Gly Ile Gln His Leu Thr  
 290 295 300  
 Ser Asp Ser Asp Ser Glu Val Tyr Cys Asp Ser Met Glu Gln Phe Gly  
 305 310 315 320  
 Gln Glu Glu Ser Leu Asp Ser Phe Thr Ser Asn Asn Gly Pro Phe Gln  
 325 330 335  
 Tyr Tyr Leu Gly Gly His Ser Ser Gln Pro Met Glu Asn Ser Gly Phe  
 340 345 350  
 Arg Glu Asp Ile Gln Val Pro Pro Gly Asn Gly Asn Ile Gly Asn Met  
 355 360 365  
 Gln Val Val Ala Val Glu Gly Lys Gly Glu Val Lys His Gly Gly Glu  
 370 375 380  
 Asp Gly Arg Asn Asn Ser Gly Ala Pro His Arg Glu Lys Arg Gly Gly  
 385 390 395 400  
 Glu Thr Asp Glu Phe Ser Asn Val Arg Arg Gly Arg Gly His Arg Met  
 405 410 415  
 Gln His Leu Ser Glu Gly Thr Lys Gly Arg Gln Val Gly Ser Gly Gly  
 420 425 430  
 Asp Gly Glu Arg Trp Gly Ser Asp Arg Gly Ser Arg Gly Ser Leu Asn  
 435 440 445  
 Glu Gln Ile Ala Leu Val Leu Met Arg Leu Gln Glu Asp Met Gln Asn  
 450 455 460  
 Val Leu Gln Arg Leu Gln Lys Leu Glu Met Leu Thr Ala Leu Gln Ala  
 465 470 475 480  
 Lys Ser Ser Thr Ser Thr Leu Gln Thr Ala Pro Gln Pro Thr Ser Gln  
 485 490 495  
 Arg Pro Ser Trp Trp Pro Phe Glu Met Ser Pro Gly Val Leu Thr Phe  
 500 505 510  
 Ala Ile Ile Trp Pro Phe Ile Ala Gln Trp Leu Val Tyr Leu Tyr Tyr  
 515 520 525  
 Gln Arg Arg Arg Arg Lys Leu Asn  
 530 535

<210> 17  
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 <213> Homo sapiens

<220>

<221> CDS

<222> (123)..(623)

<400> 17

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caccttggac agagcgggtg cgcaaatcag aaggattagt tgggacctgc cttggcgacc 120

cc atg gca tcc ccc aga acc gta act att gtg gcc ctc tca gtg gcc 167  
Met Ala Ser Pro Arg Thr Val Thr Ile Val Ala Leu Ser Val Ala  
1 5 10 15

ctg gga ctc ttc ttt gtt ttc atg ggg act atc aag ctg acc ccc agg 215  
Leu Gly Leu Phe Phe Val Phe Met Gly Thr Ile Lys Leu Thr Pro Arg  
20 25 30

ctc agc aag gat gcc tac agt gag atg aaa cgt gct tac aag agc tat 263  
Leu Ser Lys Asp Ala Tyr Ser Glu Met Lys Arg Ala Tyr Lys Ser Tyr  
35 40 45

gtt cga gcc ctc cct ctg ctg aag aaa atg ggg atc aat tcc att ctc 311  
Val Arg Ala Leu Pro Leu Leu Lys Lys Met Gly Ile Asn Ser Ile Leu  
50 55 60

ctc cga aaa agc att ggt gcc ctt gaa gtg gcc tgt ggc atc gtc atg 359  
Leu Arg Lys Ser Ile Gly Ala Leu Glu Val Ala Cys Gly Ile Val Met  
65 70 75

acc ctt gtg cct ggg cgt ccc aaa gat gtg gcc aac ttc ttc cta ctg 407  
Thr Leu Val Pro Gly Arg Pro Lys Asp Val Ala Asn Phe Phe Leu Leu  
80 85 90 95

ttg ctg gtg ttg gct gtg ctc ttc ttc cac cag ctg gtc ggt gat cct 455  
Leu Leu Val Leu Ala Val Leu Phe Phe His Gln Leu Val Gly Asp Pro  
100 105 110

ctc aaa cgc tac gcc cat gct ctg gtg ttt gga atc ctg ctc act tgc 503  
Leu Lys Arg Tyr Ala His Ala Leu Val Phe Gly Ile Leu Leu Thr Cys  
115 120 125

cgc ctg ctg att gct cgc aag ccc gaa gac cgg tct tct gag aag aag 551  
Arg Leu Leu Ile Ala Arg Lys Pro Glu Asp Arg Ser Ser Glu Lys Lys  
130 135 140

cct ttg cca ggg aat gct gag gag caa ccc tcc tta tat gag aag gcc 599  
Pro Leu Pro Gly Asn Ala Glu Glu Gln Pro Ser Leu Tyr Glu Lys Ala  
145 150 155

cct cag ggc aaa gtg aag gtg tca tagaaaa 630  
Pro Gln Gly Lys Val Lys Val Ser  
160 165

<210> 18

<211> 167

<212> PRT

<213> Homo sapiens

<400> 18

Met Ala Ser Pro Arg Thr Val Thr Ile Val Ala Leu Ser Val Ala Leu  
1 5 10 15

Gly Leu Phe Phe Val Phe Met Gly Thr Ile Lys Leu Thr Pro Arg Leu  
20 25 30

Ser Lys Asp Ala Tyr Ser Glu Met Lys Arg Ala Tyr Lys Ser Tyr Val  
35 40 45

Arg Ala Leu Pro Leu Leu Lys Lys Met Gly Ile Asn Ser Ile Leu Leu  
50 55 60

Arg Lys Ser Ile Gly Ala Leu Glu Val Ala Cys Gly Ile Val Met Thr  
65 70 75 80

Leu Val Pro Gly Arg Pro Lys Asp Val Ala Asn Phe Phe Leu Leu Leu  
85 90 95

Leu Val Leu Ala Val Leu Phe Phe His Gln Leu Val Gly Asp Pro Leu  
100 105 110

Lys Arg Tyr Ala His Ala Leu Val Phe Gly Ile Leu Leu Thr Cys Arg  
115 120 125

Leu Leu Ile Ala Arg Lys Pro Glu Asp Arg Ser Ser Glu Lys Lys Pro  
130 135 140

Leu Pro Gly Asn Ala Glu Glu Gln Pro Ser Leu Tyr Glu Lys Ala Pro  
145 150 155 160

Gln Gly Lys Val Lys Val Ser  
165

<210> 19

<211> 1737

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (296)..(1687)

<220>

<221> variation

<222> (1)..(1737)

<223> N may be any nucleotide

<400> 19

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aaatcacccg tcttctgcgt cgctcacgct gggagctgta gaccagagct gttcctattc 120

ggccatcttg gctcctccct cgaaagatta tcactttgaa tatacggaa gtgatagcag 180



| 195   | 200 | 205 |      |
|---|-----|-----|------|
| ata agg tgt aaa gac gac tct caa ttt tca gag gaa gga tcc agt gag<br>Ile Arg Cys Lys Asp Asp Ser Gln Phe Ser Glu Glu Gly Ser Ser Glu<br>210 215 220 225 |     |     | 970  |
| tgt aca gag cgc cct ccc tgt acc aca aaa gac tat ttc cag atc cat<br>Cys Thr Glu Arg Pro Pro Cys Thr Thr Lys Asp Tyr Phe Gln Ile His<br>230 235 240     |     |     | 1018 |
| act cca tgt gat gaa gaa gga aag aca cag ata atg tac aag tgg ata<br>Thr Pro Cys Asp Glu Glu Gly Lys Thr Gln Ile Met Tyr Lys Trp Ile<br>245 250 255     |     |     | 1066 |
| gag ccc aaa atc tgc cgg gag gat ctc aca gat gct att aga ttg ccc<br>Glu Pro Lys Ile Cys Arg Glu Asp Leu Thr Asp Ala Ile Arg Leu Pro<br>260 265 270     |     |     | 1114 |
| cct tct gga gag aag aag gat tgt ccg cct tgc aac cct gga ttt tat<br>Pro Ser Gly Glu Lys Lys Asp Cys Pro Pro Cys Asn Pro Gly Phe Tyr<br>275 280 285     |     |     | 1162 |
| aac aat gga tca tct tct tgc cat ccc tgt cct cct gga aca ttt tca<br>Asn Asn Gly Ser Ser Ser Cys His Pro Cys Pro Pro Gly Thr Phe Ser<br>290 295 300 305 |     |     | 1210 |
| gat gga acc aaa gaa tgt aga cca tgt cca gca gga acg gag cct gca<br>Asp Gly Thr Lys Glu Cys Arg Pro Cys Pro Ala Gly Thr Glu Pro Ala<br>310 315 320     |     |     | 1258 |
| ctt ggc ttt gaa tat aaa tgg tgg aat gtc ctt cct ggc aac atg aaa<br>Leu Gly Phe Glu Tyr Lys Trp Trp Asn Val Leu Pro Gly Asn Met Lys<br>325 330 335     |     |     | 1306 |
| act tcc tgc ttc aat gtt ggg aat tca aag tgc gat gga atg aat ggt<br>Thr Ser Cys Phe Asn Val Gly Asn Ser Lys Cys Asp Gly Met Asn Gly<br>340 345 350     |     |     | 1354 |
| tgg gag gtg gct gga gat cat atc cag agt ggg gct gga ggt tct gac<br>Trp Glu Val Ala Gly Asp His Ile Gln Ser Gly Ala Gly Gly Ser Asp<br>355 360 365     |     |     | 1402 |
| aat gat tac ctg atc tta aac ttg cat atc cca gga ttt aaa cca cca<br>Asn Asp Tyr Leu Ile Leu Asn Leu His Ile Pro Gly Phe Lys Pro Pro<br>370 375 380 385 |     |     | 1450 |
| aca tct atg act gga gcc acg ggt tct gaa cta gga aga ata aca ttt<br>Thr Ser Met Thr Gly Ala Thr Gly Ser Glu Leu Gly Arg Ile Thr Phe<br>390 395 400     |     |     | 1498 |
| gtc ttt gag acc ctc tgt tca gct gac tgt gtt ttg tac ttc atg gtg<br>Val Phe Glu Thr Leu Cys Ser Ala Asp Cys Val Leu Tyr Phe Met Val<br>405 410 415     |     |     | 1546 |
| gat att aat aga aaa agt aca aat gtg gta gaa tcg tgg ggt gga acc<br>Asp Ile Asn Arg Lys Ser Thr Asn Val Val Glu Ser Trp Gly Gly Thr<br>420 425 430     |     |     | 1594 |

aaa gaa aaa caa gct tac acc cat atc atc ttc aag aat gca act ttt 1642  
 Lys Glu Lys Gln Ala Tyr Thr His Ile Ile Phe Lys Asn Ala Thr Phe  
 435 440 445

aca ttt aca tgg ggc att ccc aga gaa cta att cag ggt cca aga 1687  
 Thr Phe Thr Trp Gly Ile Pro Arg Glu Leu Ile Gln Gly Pro Arg  
 450 455 460

taatagacgg ttccnccatt gacatgtttg aaggatttat tcctattcac 1737

<210> 20  
 <211> 464  
 <212> PRT  
 <213> Homo sapiens

<400> 20  
 Met Lys Asn Gln Val Cys Ser Lys Cys Gly Glu Gly Thr Tyr Ser Leu  
 1 5 10 15

Gly Ser Gly Ile Lys Phe Asp Glu Trp Asp Glu Leu Pro Ala Gly Phe  
 20 25 30

Ser Asn Ile Ala Thr Phe Met Asp Thr Val Val Gly Pro Ser Asp Ser  
 35 40 45

Arg Pro Asp Gly Cys Asn Asn Ser Ser Trp Ile Pro Arg Gly Asn Tyr  
 50 55 60

Ile Glu Ser Asn Arg Asp Asp Cys Thr Val Ser Leu Ile Tyr Ala Val  
 65 70 75 80

His Leu Lys Lys Ser Gly Tyr Val Phe Phe Glu Tyr Gln Tyr Val Asp  
 85 90 95

Asn Asn Ile Phe Phe Glu Phe Phe Ile Gln Asn Asp Gln Cys Gln Glu  
 100 105 110

Met Asp Thr Thr Thr Asp Lys Trp Val Lys Leu Thr Asp Asn Gly Glu  
 115 120 125

Trp Gly Ser His Ser Val Met Leu Lys Ser Gly Thr Asn Ile Leu Tyr  
 130 135 140

Trp Arg Thr Thr Gly Ile Leu Met Gly Ser Lys Ala Val Lys Pro Val  
 145 150 155 160

Leu Val Lys Asn Ile Thr Ile Glu Gly Val Ala Tyr Thr Ser Glu Cys  
 165 170 175

Phe Pro Cys Lys Pro Gly Thr Phe Ser Asn Lys Pro Gly Ser Phe Asn  
 180 185 190

Cys Gln Val Cys Pro Arg Asn Thr Tyr Ser Glu Lys Gly Ala Lys Glu  
 195 200 205



Cys Ile Arg Cys Lys Asp Asp Ser Gln Phe Ser Glu Glu Gly Ser Ser  
 210 215 220  
 Glu Cys Thr Glu Arg Pro Pro Cys Thr Thr Lys Asp Tyr Phe Gln Ile  
 225 230 235 240  
 His Thr Pro Cys Asp Glu Glu Gly Lys Thr Gln Ile Met Tyr Lys Trp  
 245 250 255  
 Ile Glu Pro Lys Ile Cys Arg Glu Asp Leu Thr Asp Ala Ile Arg Leu  
 260 265 270  
 Pro Pro Ser Gly Glu Lys Lys Asp Cys Pro Pro Cys Asn Pro Gly Phe  
 275 280 285  
 Tyr Asn Asn Gly Ser Ser Ser Cys His Pro Cys Pro Pro Gly Thr Phe  
 290 295 300  
 Ser Asp Gly Thr Lys Glu Cys Arg Pro Cys Pro Ala Gly Thr Glu Pro  
 305 310 315 320  
 Ala Leu Gly Phe Glu Tyr Lys Trp Trp Asn Val Leu Pro Gly Asn Met  
 325 330 335  
 Lys Thr Ser Cys Phe Asn Val Gly Asn Ser Lys Cys Asp Gly Met Asn  
 340 345 350  
 Gly Trp Glu Val Ala Gly Asp His Ile Gln Ser Gly Ala Gly Gly Ser  
 355 360 365  
 Asp Asn Asp Tyr Leu Ile Leu Asn Leu His Ile Pro Gly Phe Lys Pro  
 370 375 380  
 Pro Thr Ser Met Thr Gly Ala Thr Gly Ser Glu Leu Gly Arg Ile Thr  
 385 390 395 400  
 Phe Val Phe Glu Thr Leu Cys Ser Ala Asp Cys Val Leu Tyr Phe Met  
 405 410 415  
 Val Asp Ile Asn Arg Lys Ser Thr Asn Val Val Glu Ser Trp Gly Gly  
 420 425 430  
 Thr Lys Glu Lys Gln Ala Tyr Thr His Ile Ile Phe Lys Asn Ala Thr  
 435 440 445  
 Phe Thr Phe Thr Trp Gly Ile Pro Arg Glu Leu Ile Gln Gly Pro Arg  
 450 455 460

<210> 21  
 <211> 2156  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (166)..(2037)

<220>

<221> variation

<222> (1)..(2156)

<223> N may be any nucleotide

<400> 21

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attgtctgcg ctggggaagg ggacaggccg ggaccgggac ctccgctcgc agccggccgc 120

accagcagga cagctggcct gaagctcaga gccggggcgt gcgcc atg gcc cca cac 177

Met Ala Pro His

1

tgg gct gtc tgg ctg ctg gca gca agg ctg tgg ggc ctg ggc att ggg 225

Trp Ala Val Trp Leu Leu Ala Ala Arg Leu Trp Gly Leu Gly Ile Gly

5

10

15

20

gct gag gtg tgg tgg aac ctt gtg ccg cgt aag aca gtg tct tct ggg 273

Ala Glu Val Trp Trp Asn Leu Val Pro Arg Lys Thr Val Ser Ser Gly

25

30

35

gag ctg gcc acg gta gta cgg cgg ttc tcc cag acc ggc atc cag gac 321

Glu Leu Ala Thr Val Val Arg Arg Phe Ser Gln Thr Gly Ile Gln Asp

40

45

50

ttc ctg aca ctg acg ctg acg gag ccc act ggg ctt ctg tac gtg ggc 369

Phe Leu Thr Leu Thr Leu Thr Glu Pro Thr Gly Leu Leu Tyr Val Gly

55

60

65

gcc cga gag gcc ctg ttt gcc ttc agc atg gag gcc ctg gag ctg caa 417

Ala Arg Glu Ala Leu Phe Ala Phe Ser Met Glu Ala Leu Glu Leu Gln

70

75

80

gga gcg atc tcc tgg gag gcc ccc gtg gag aag aag act gag tgt atc 465

Gly Ala Ile Ser Trp Glu Ala Pro Val Glu Lys Lys Thr Glu Cys Ile

85

90

95

100

cag aaa ggg aag aac aac cag acc gag tgc ttc aac ttc atc cgc ttc 513

Gln Lys Gly Lys Asn Asn Gln Thr Glu Cys Phe Asn Phe Ile Arg Phe

105

110

115

ctg cag ccc tac aat gcc tcc cac ctg tac gtc tgt ggc acc tac gcc 561

Leu Gln Pro Tyr Asn Ala Ser His Leu Tyr Val Cys Gly Thr Tyr Ala

120

125

130

ttc cag ccc aag tgc acc tac gtc aac atg ctc acc ttc act ttg gag 609

Phe Gln Pro Lys Cys Thr Tyr Val Asn Met Leu Thr Phe Thr Leu Glu

135

140

145

cat gga gag ttt gaa gat ggg aag ggc aag tgt ccc tat gac cca gct 657

His Gly Glu Phe Glu Asp Gly Lys Gly Lys Cys Pro Tyr Asp Pro Ala

150

155

160

aag ggc cat gct ggc ctt ctt gtg gat ggt gag ctg tac tcg gcc aca 705

Lys Gly His Ala Gly Leu Leu Val Asp Gly Glu Leu Tyr Ser Ala Thr

| 165   | 170 | 175 | 180 |      |
|---|-----|-----|-----|------|
| ctc aac aac ttc ctg ggc acg gaa ccc att atc ctg cgt aac atg ggg |     |     |     | 753  |
| Leu Asn Asn Phe Leu Gly Thr Glu Pro Ile Ile Leu Arg Asn Met Gly |     |     |     |      |
|   | 185 | 190 | 195 |      |
| ccc cac cac tcc atg aag aca gag tac ctg gcc ttt tgg ctc aac gaa |     |     |     | 801  |
| Pro His His Ser Met Lys Thr Glu Tyr Leu Ala Phe Trp Leu Asn Glu |     |     |     |      |
|   | 200 | 205 | 210 |      |
| cct cac ttt gta ggc tct gcc tat gta cct gag agt gtg ggc agc ttc |     |     |     | 849  |
| Pro His Phe Val Gly Ser Ala Tyr Val Pro Glu Ser Val Gly Ser Phe |     |     |     |      |
|   | 215 | 220 | 225 |      |
| acg ggg gac gac gac aag gtc tac ttc ttc ttc agg gag cgg gca gtg |     |     |     | 897  |
| Thr Gly Asp Asp Asp Lys Val Tyr Phe Phe Phe Arg Glu Arg Ala Val |     |     |     |      |
|   | 230 | 235 | 240 |      |
| gag tcc gac tgc tat gcc gag cag gtg gtg gct cgt gtg gcc cgt gtc |     |     |     | 945  |
| Glu Ser Asp Cys Tyr Ala Glu Gln Val Val Ala Arg Val Ala Arg Val |     |     |     |      |
|   | 245 | 250 | 255 | 260  |
| tgc aag ggc gat atg ggg ggc gca cgg acc ctg cag agg aag tgg acc |     |     |     | 993  |
| Cys Lys Gly Asp Met Gly Gly Ala Arg Thr Leu Gln Arg Lys Trp Thr |     |     |     |      |
|   | 265 | 270 | 275 |      |
| acg ttc ctg aag gcg cgg ctg gca tgc tct gcc ccg aac tgg cag ctc |     |     |     | 1041 |
| Thr Phe Leu Lys Ala Arg Leu Ala Cys Ser Ala Pro Asn Trp Gln Leu |     |     |     |      |
|   | 280 | 285 | 290 |      |
| tac ttc aac cag ctg cag gcg atg cac acc ctg cag gac acc tcc tgg |     |     |     | 1089 |
| Tyr Phe Asn Gln Leu Gln Ala Met His Thr Leu Gln Asp Thr Ser Trp |     |     |     |      |
|   | 295 | 300 | 305 |      |
| cac aac acc acc ttc ttt ggg gtt ttt caa gca cag tgg ggt gac atg |     |     |     | 1137 |
| His Asn Thr Thr Phe Phe Gly Val Phe Gln Ala Gln Trp Gly Asp Met |     |     |     |      |
|   | 310 | 315 | 320 |      |
| tac ctg tcg gcc atc tgt gag tac cag ttg gaa gag atc cag cgg gtg |     |     |     | 1185 |
| Tyr Leu Ser Ala Ile Cys Glu Tyr Gln Leu Glu Glu Ile Gln Arg Val |     |     |     |      |
|   | 325 | 330 | 335 | 340  |
| ttt gag ggc ccc tat aag gag tac cat gag gaa gcc cag aag tgg gac |     |     |     | 1233 |
| Phe Glu Gly Pro Tyr Lys Glu Tyr His Glu Glu Ala Gln Lys Trp Asp |     |     |     |      |
|   | 345 | 350 | 355 |      |
| cgc tac act gac cct gta ccc agc cct cgg cct ggc tcg tgc att aac |     |     |     | 1281 |
| Arg Tyr Thr Asp Pro Val Pro Ser Pro Arg Pro Gly Ser Cys Ile Asn |     |     |     |      |
|   | 360 | 365 | 370 |      |
| aac tgg cat cgg cgc cac ggc tac acc agc tcc ctg gag cta ccc gac |     |     |     | 1329 |
| Asn Trp His Arg Arg His Gly Tyr Thr Ser Ser Leu Glu Leu Pro Asp |     |     |     |      |
|   | 375 | 380 | 385 |      |
| aac atc ctc aac ttc gtc aag aag cac ccg ctg atg gag gag cag gtg |     |     |     | 1377 |
| Asn Ile Leu Asn Phe Val Lys Lys His Pro Leu Met Glu Glu Gln Val |     |     |     |      |
|   | 390 | 395 | 400 |      |

|   |      |
|---|------|
| ggg cct cgg tgg agc cgc ccc ctg ctc gtg aag aag ggc acc aac ttc | 1425 |
| Gly Pro Arg Trp Ser Arg Pro Leu Leu Val Lys Lys Gly Thr Asn Phe |      |
| 405 410 415 420   |      |
| acc cac ctg gtg gcc gac cgg gtt aca gga ctt gat gga gcc acc tat | 1473 |
| Thr His Leu Val Ala Asp Arg Val Thr Gly Leu Asp Gly Ala Thr Tyr |      |
| 425 430 435   |      |
| aca gtg ctg ttc att ggc aca gga gac ggc tgg ctg ctc aag gct gtg | 1521 |
| Thr Val Leu Phe Ile Gly Thr Gly Asp Gly Trp Leu Leu Lys Ala Val |      |
| 440 445 450   |      |
| agc ctg ggg ccc tgg gtt cac ctg att gag gag ctg cag ctg ttt gac | 1569 |
| Ser Leu Gly Pro Trp Val His Leu Ile Glu Glu Leu Gln Leu Phe Asp |      |
| 455 460 465   |      |
| cag gag ccc atg aga agc ctg gtg cta tct cag agc aaa aag ctg ctc | 1617 |
| Gln Glu Pro Met Arg Ser Leu Val Leu Ser Gln Ser Lys Lys Leu Leu |      |
| 470 475 480   |      |
| ttt gcc ggc tcc cgc tct cag ctg gtg cag ctg ccc gtg gcc gac tgc | 1665 |
| Phe Ala Gly Ser Arg Ser Gln Leu Val Gln Leu Pro Val Ala Asp Cys |      |
| 485 490 495 500   |      |
| att aag tat cgc tcc tgt gca gac tgt gtc ctc gcc cgg gac ccc tat | 1713 |
| Ile Lys Tyr Arg Ser Cys Ala Asp Cys Val Leu Ala Arg Asp Pro Tyr |      |
| 505 510 515   |      |
| tgc gcc tgg agc gtc aac acc agc cgc tgt gtg gcc gtg ggt ggc cac | 1761 |
| Cys Ala Trp Ser Val Asn Thr Ser Arg Cys Val Ala Val Gly Gly His |      |
| 520 525 530   |      |
| tct gga tct cta ctg atc cag cat gtg atg acc tcg gac act tca ggc | 1809 |
| Ser Gly Ser Leu Leu Ile Gln His Val Met Thr Ser Asp Thr Ser Gly |      |
| 535 540 545   |      |
| atc tgc aac ctc cgt ggc agt aag aaa gtc agg ccc act ccc aaa aac | 1857 |
| Ile Cys Asn Leu Arg Gly Ser Lys Lys Val Arg Pro Thr Pro Lys Asn |      |
| 550 555 560   |      |
| atc acg gtg gtg gcg ggc aca gac ctg gtg ctg ccc tgc cac ctc tcc | 1905 |
| Ile Thr Val Val Ala Gly Thr Asp Leu Val Leu Pro Cys His Leu Ser |      |
| 565 570 575 580   |      |
| tcc act tgg ccc cgg ggt tca gtg gta ttt tat act tgc ctt ctt cct | 1953 |
| Ser Thr Trp Pro Arg Gly Ser Val Val Phe Tyr Thr Cys Leu Leu Pro |      |
| 585 590 595   |      |
| gta cag ggc tgg gaa agg ctg tgt gag ggg aaa aaa agg aaa ggg tgg | 2001 |
| Val Gln Gly Trp Glu Arg Leu Cys Glu Gly Lys Lys Arg Lys Gly Trp |      |
| 600 605 610   |      |
| gcc tgc tgt gga caa tgg cat act ctc ttc cag ccc taggaggagg      | 2047 |
| Ala Cys Cys Gly Gln Trp His Thr Leu Phe Gln Pro                 |      |
| 615 620   |      |

21

gctcctaaca gtgtaactta ttgtgtcccc gcgtatttat ttgttgtaaa tatttgagta 2107  
 tttttatatt gacaaataaa atggagaaaa tgaaaaaaaa aaaaaaaaaa 2156

<210> 22  
 <211> 624  
 <212> PRT  
 <213> Homo sapiens

<400> 22  
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 1 5 10 15  
 Leu Gly Ile Gly Ala Glu Val Trp Trp Asn Leu Val Pro Arg Lys Thr  
 20 25 30  
 Val Ser Ser Gly Glu Leu Ala Thr Val Val Arg Arg Phe Ser Gln Thr  
 35 40 45  
 Gly Ile Gln Asp Phe Leu Thr Leu Thr Leu Thr Glu Pro Thr Gly Leu  
 50 55 60  
 Leu Tyr Val Gly Ala Arg Glu Ala Leu Phe Ala Phe Ser Met Glu Ala  
 65 70 75 80  
 Leu Glu Leu Gln Gly Ala Ile Ser Trp Glu Ala Pro Val Glu Lys Lys  
 85 90 95  
 Thr Glu Cys Ile Gln Lys Gly Lys Asn Asn Gln Thr Glu Cys Phe Asn  
 100 105 110  
 Phe Ile Arg Phe Leu Gln Pro Tyr Asn Ala Ser His Leu Tyr Val Cys  
 115 120 125  
 Gly Thr Tyr Ala Phe Gln Pro Lys Cys Thr Tyr Val Asn Met Leu Thr  
 130 135 140  
 Phe Thr Leu Glu His Gly Glu Phe Glu Asp Gly Lys Gly Lys Cys Pro  
 145 150 155 160  
 Tyr Asp Pro Ala Lys Gly His Ala Gly Leu Leu Val Asp Gly Glu Leu  
 165 170 175  
 Tyr Ser Ala Thr Leu Asn Asn Phe Leu Gly Thr Glu Pro Ile Ile Leu  
 180 185 190  
 Arg Asn Met Gly Pro His His Ser Met Lys Thr Glu Tyr Leu Ala Phe  
 195 200 205  
 Trp Leu Asn Glu Pro His Phe Val Gly Ser Ala Tyr Val Pro Glu Ser  
 210 215 220  
 Val Gly Ser Phe Thr Gly Asp Asp Asp Lys Val Tyr Phe Phe Phe Arg  
 225 230 235 240  
 Glu Arg Ala Val Glu Ser Asp Cys Tyr Ala Glu Gln Val Val Ala Arg

245                      250                      255  
 Val Ala Arg Val Cys Lys Gly Asp Met Gly Gly Ala Arg Thr Leu Gln  
                          260                      265                      270  
 Arg Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ala Cys Ser Ala Pro  
                          275                      280                      285  
 Asn Trp Gln Leu Tyr Phe Asn Gln Leu Gln Ala Met His Thr Leu Gln  
                          290                      295                      300  
 Asp Thr Ser Trp His Asn Thr Thr Phe Phe Gly Val Phe Gln Ala Gln  
 305                                   310                                   315                                   320  
 Trp Gly Asp Met Tyr Leu Ser Ala Ile Cys Glu Tyr Gln Leu Glu Glu  
                                  325                                   330                                   335  
 Ile Gln Arg Val Phe Glu Gly Pro Tyr Lys Glu Tyr His Glu Glu Ala  
                                  340                                   345                                   350  
 Gln Lys Trp Asp Arg Tyr Thr Asp Pro Val Pro Ser Pro Arg Pro Gly  
                                  355                                   360                                   365  
 Ser Cys Ile Asn Asn Trp His Arg Arg His Gly Tyr Thr Ser Ser Leu  
                                  370                                   375                                   380  
 Glu Leu Pro Asp Asn Ile Leu Asn Phe Val Lys Lys His Pro Leu Met  
 385                                   390                                   395                                   400  
 Glu Glu Gln Val Gly Pro Arg Trp Ser Arg Pro Leu Leu Val Lys Lys  
                                  405                                   410                                   415  
 Gly Thr Asn Phe Thr His Leu Val Ala Asp Arg Val Thr Gly Leu Asp  
                                  420                                   425                                   430  
 Gly Ala Thr Tyr Thr Val Leu Phe Ile Gly Thr Gly Asp Gly Trp Leu  
                                  435                                   440                                   445  
 Leu Lys Ala Val Ser Leu Gly Pro Trp Val His Leu Ile Glu Glu Leu  
                                  450                                   455                                   460  
 Gln Leu Phe Asp Gln Glu Pro Met Arg Ser Leu Val Leu Ser Gln Ser  
 465                                   470                                   475                                   480  
 Lys Lys Leu Leu Phe Ala Gly Ser Arg Ser Gln Leu Val Gln Leu Pro  
                                  485                                   490                                   495  
 Val Ala Asp Cys Ile Lys Tyr Arg Ser Cys Ala Asp Cys Val Leu Ala  
                                  500                                   505                                   510  
 Arg Asp Pro Tyr Cys Ala Trp Ser Val Asn Thr Ser Arg Cys Val Ala  
                                  515                                   520                                   525  
 Val Gly Gly His Ser Gly Ser Leu Leu Ile Gln His Val Met Thr Ser  
                                  530                                   535                                   540  
 Asp Thr Ser Gly Ile Cys Asn Leu Arg Gly Ser Lys Lys Val Arg Pro

|   |     |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|-----|
| 545   |     | 550 |     | 555 |     | 560 |
| Thr Pro Lys Asn Ile Thr Val Val Ala Gly Thr Asp Leu Val Leu Pro |     |     |     |     |     |     |
|   | 565 |     |     | 570 |     | 575 |
| Cys His Leu Ser Ser Thr Trp Pro Arg Gly Ser Val Val Phe Tyr Thr |     |     |     |     |     |     |
|   | 580 |     | 585 |     | 590 |     |
| Cys Leu Leu Pro Val Gln Gly Trp Glu Arg Leu Cys Glu Gly Lys Lys |     |     |     |     |     |     |
|   | 595 |     | 600 |     | 605 |     |
| Arg Lys Gly Trp Ala Cys Cys Gly Gln Trp His Thr Leu Phe Gln Pro |     |     |     |     |     |     |
|   | 610 |     | 615 |     | 620 |     |

<210> 23  
 <211> 2056  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (7)..(1608)

<220>  
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 <222> (1)..(2056)  
 <223> N may be any nucleotide

<220>  
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 <222> (1)..(2056)  
 <223> N may be any nucleotide

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 cgctcc atg tat nag ttt cat gca ggc tct tgg gaa agc tgg tgc tgc 48  
 Met Tyr Xaa Phe His Ala Gly Ser Trp Glu Ser Trp Cys Cys  
 1 5 10

tgc tgc ctg att ccc gcc gac aga cct tgg gac cgg ggc caa cac tgg 96  
 Cys Cys Leu Ile Pro Ala Asp Arg Pro Trp Asp Arg Gly Gln His Trp  
 15 20 25 30

cag ctg gag atg gcg gac acg aga tcc gtg cac gag act agg ttt gag 144  
 Gln Leu Glu Met Ala Asp Thr Arg Ser Val His Glu Thr Arg Phe Glu  
 35 40 45

gcg gcc gtg aag gtg atc cag agt ttg ccg aag aat gat tca ttc cag 192  
 Ala Ala Val Lys Val Ile Gln Ser Leu Pro Lys Asn Asp Ser Phe Gln  
 50 55 60

cca aca aat gaa atg atg ctt aaa ttt tat agc ttc tat aag cag gca 240  
 Pro Thr Asn Glu Met Met Leu Lys Phe Tyr Ser Phe Tyr Lys Gln Ala  
 65 70 75

act gaa gga ccc tgt aaa ctt tca agg cct gga ttt tgg gat cct att 288  
 Thr Glu Gly Pro Cys Lys Leu Ser Arg Pro Gly Phe Trp Asp Pro Ile

| 80  | 85  | 90  |     |
|---|-----|-----|-----|
| gga aga tat aaa tgg gat gct tgg agt tca ctg ggt gat atg acc aaa |     |     | 336 |
| Gly Arg Tyr Lys Trp Asp Ala Trp Ser Ser Leu Gly Asp Met Thr Lys |     |     |     |
| 95  | 100 | 105 | 110 |
| gag gaa gcc atg att gca tat gtt gaa gaa atg aaa aag att att gaa |     |     | 384 |
| Glu Glu Ala Met Ile Ala Tyr Val Glu Glu Met Lys Lys Ile Ile Glu |     |     |     |
|   | 115 | 120 | 125 |
| act atg cca atg act gag aaa gtt gaa gaa ttg ctg cgt gtc ata ggt |     |     | 432 |
| Thr Met Pro Met Thr Glu Lys Val Glu Glu Leu Leu Arg Val Ile Gly |     |     |     |
|   | 130 | 135 | 140 |
| cca ttt tat gaa att gtc gag gac aaa aag agt ggc agg agt tct gat |     |     | 480 |
| Pro Phe Tyr Glu Ile Val Glu Asp Lys Lys Ser Gly Arg Ser Ser Asp |     |     |     |
|   | 145 | 150 | 155 |
| ata acc tca gtc cga ctg gag aaa atc tct aaa tgt tta gaa gat ctt |     |     | 528 |
| Ile Thr Ser Val Arg Leu Glu Lys Ile Ser Lys Cys Leu Glu Asp Leu |     |     |     |
|   | 160 | 165 | 170 |
| ggt aat gtt ctc act tct act cca aac gcc aaa acc gtt aat ggt aaa |     |     | 576 |
| Gly Asn Val Leu Thr Ser Thr Pro Asn Ala Lys Thr Val Asn Gly Lys |     |     |     |
| 175   | 180 | 185 | 190 |
| gct gaa agc agt gac agt gga gcc gag tct gag gaa gaa gag gcc caa |     |     | 624 |
| Ala Glu Ser Ser Asp Ser Gly Ala Glu Ser Glu Glu Glu Glu Ala Gln |     |     |     |
|   | 195 | 200 | 205 |
| gaa gaa gtg aaa gga gca gaa caa agt gat aat gat aag aaa atg atg |     |     | 672 |
| Glu Glu Val Lys Gly Ala Glu Gln Ser Asp Asn Asp Lys Lys Met Met |     |     |     |
|   | 210 | 215 | 220 |
| aag aag tca gca gac cat aag aat ttg gaa gtc att gtc act aat ggc |     |     | 720 |
| Lys Lys Ser Ala Asp His Lys Asn Leu Glu Val Ile Val Thr Asn Gly |     |     |     |
|   | 225 | 230 | 235 |
| tat gat aaa gat ggc ttt gtt cag gat ata cag aat gac att cat gcc |     |     | 768 |
| Tyr Asp Lys Asp Gly Phe Val Gln Asp Ile Gln Asn Asp Ile His Ala |     |     |     |
|   | 240 | 245 | 250 |
| agt tct tcc ctg aat ggc aga agc act gaa gaa gta aag ccc att gat |     |     | 816 |
| Ser Ser Ser Leu Asn Gly Arg Ser Thr Glu Glu Val Lys Pro Ile Asp |     |     |     |
| 255   | 260 | 265 | 270 |
| gaa aac ttg ggg caa act gga aaa tct gct gtt tgc att cac caa gat |     |     | 864 |
| Glu Asn Leu Gly Gln Thr Gly Lys Ser Ala Val Cys Ile His Gln Asp |     |     |     |
|   | 275 | 280 | 285 |
| ata aat gat gat cat gtt gaa gat gtt aca gga att cag cat ttg aca |     |     | 912 |
| Ile Asn Asp Asp His Val Glu Asp Val Thr Gly Ile Gln His Leu Thr |     |     |     |
|   | 290 | 295 | 300 |
| agc gat tca gac agt gaa gtt tac tgt gat tct atg gaa caa ttt gga |     |     | 960 |
| Ser Asp Ser Asp Ser Glu Val Tyr Cys Asp Ser Met Glu Gln Phe Gly |     |     |     |
|   | 305 | 310 | 315 |



|  |      |
|--|------|
| caa gaa gag tct tta gac agc ttt acg tcc aac aat gga cca ttt cag  | 1008 |
| Gln Glu Glu Ser Leu Asp Ser Phe Thr Ser Asn Asn Gly Pro Phe Gln  |      |
| 320 325 330  |      |
| tat tac ttg ggt ggt cat tcc agt caa ccc atg gaa aat tct gga ttt  | 1056 |
| Tyr Tyr Leu Gly Gly His Ser Ser Gln Pro Met Glu Asn Ser Gly Phe  |      |
| 335 340 345 350  |      |
| cgt gaa gat att caa gta cct cct gga aat ggc aac att ggg aat atg  | 1104 |
| Arg Glu Asp Ile Gln Val Pro Pro Gly Asn Gly Asn Ile Gly Asn Met  |      |
| 355 360 365  |      |
| cag gtg gtt gca gtt gaa gga aaa ggt gaa gtc aag cat gga gga gaa  | 1152 |
| Gln Val Val Ala Val Glu Gly Lys Gly Glu Val Lys His Gly Gly Glu  |      |
| 370 375 380  |      |
| gat ggc agg aat aac agc gga gca cca cac cgg gag aag cga ggc gga  | 1200 |
| Asp Gly Arg Asn Asn Ser Gly Ala Pro His Arg Glu Lys Arg Gly Gly  |      |
| 385 390 395  |      |
| gaa act gac gaa ttc tct aat gtt aga aga gga aga gga cat agg atg  | 1248 |
| Glu Thr Asp Glu Phe Ser Asn Val Arg Arg Gly Arg Gly His Arg Met  |      |
| 400 405 410  |      |
| caa cac ttg agc gaa gga acc aag ggc cgg cag gtg gga agt gga ggt  | 1296 |
| Gln His Leu Ser Glu Gly Thr Lys Gly Arg Gln Val Gly Ser Gly Gly  |      |
| 415 420 425 430  |      |
| gat ggg gag cgc tgg ggc tcc gac aga ggg tcc cga ggc agc ctc aat  | 1344 |
| Asp Gly Glu Arg Trp Gly Ser Asp Arg Gly Ser Arg Gly Ser Leu Asn  |      |
| 435 440 445  |      |
| gag cag atc gcc ctc gtg ctg atg aga ctg cag gag gac atg cag aat  | 1392 |
| Glu Gln Ile Ala Leu Val Leu Met Arg Leu Gln Glu Asp Met Gln Asn  |      |
| 450 455 460  |      |
| gtc ctt cag aga ctg cag aaa ctg gaa acg ctg act gct ttg cag gca  | 1440 |
| Val Leu Gln Arg Leu Gln Lys Leu Glu Thr Leu Thr Ala Leu Gln Ala  |      |
| 465 470 475  |      |
| aaa tca tca aca tca aca ttg cag act gct cct cag ccc acc tca cag  | 1488 |
| Lys Ser Ser Thr Ser Thr Leu Gln Thr Ala Pro Gln Pro Thr Ser Gln  |      |
| 480 485 490  |      |
| aga cca tct tgg tgg ccc ttc gag atg tct cct ggt gtg cta acg ttt  | 1536 |
| Arg Pro Ser Trp Trp Pro Phe Glu Met Ser Pro Gly Val Leu Thr Phe  |      |
| 495 500 505 510  |      |
| gcc atc ata tgg cct ttt att gca cag tgg ttg gtg tat tta tac tat  | 1584 |
| Ala Ile Ile Trp Pro Phe Ile Ala Gln Trp Leu Val Tyr Leu Tyr Tyr  |      |
| 515 520 525  |      |
| caa aga agg aga aga aaa ctg aac tgaggaaaat ggtgttttcc tcaagaagac | 1638 |
| Gln Arg Arg Arg Arg Lys Leu Asn                                  |      |
| 530  |      |

tactggaact ggatgacctc agaatgaact ggattgtggt gttcacaaga aaatcttagt 1698  
 ttgtgatgat tacattgctt tttgttgctc agtagtttag tttgtgtaca tatatacaca 1758  
 tatatatattt gcactacaca aacgataaca ttttaaggac taatattgct gatacttgaa 1818  
 taatcaatct ctactagggtt ataagtagta tacacagatt taccctgccc ttgaacttga 1878  
 aggacattaa attattaatg atcatttggt aacatgttta cctgattatc ttccatagag 1938  
 taacataagc tgcttttcaa aggtaccatt gtgataatga gatcaaattt ataagttatt 1998  
 atttttaatt ttctaaatta aataaaagaa agaatgcaaa aaaaaaaaaa aaaaaaaaaa 2056

<210> 24  
 <211> 534  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <221> variation  
 <222> (3)  
 <223> Xaa may be any amino acid

<400> 24  
 Met Tyr Xaa Phe His Ala Gly Ser Trp Glu Ser Trp Cys Cys Cys Cys  
 1 5 10 15  
 Leu Ile Pro Ala Asp Arg Pro Trp Asp Arg Gly Gln His Trp Gln Leu  
 20 25 30  
 Glu Met Ala Asp Thr Arg Ser Val His Glu Thr Arg Phe Glu Ala Ala  
 35 40 45  
 Val Lys Val Ile Gln Ser Leu Pro Lys Asn Asp Ser Phe Gln Pro Thr  
 50 55 60  
 Asn Glu Met Met Leu Lys Phe Tyr Ser Phe Tyr Lys Gln Ala Thr Glu  
 65 70 75 80  
 Gly Pro Cys Lys Leu Ser Arg Pro Gly Phe Trp Asp Pro Ile Gly Arg  
 85 90 95  
 Tyr Lys Trp Asp Ala Trp Ser Ser Leu Gly Asp Met Thr Lys Glu Glu  
 100 105 110  
 Ala Met Ile Ala Tyr Val Glu Glu Met Lys Lys Ile Ile Glu Thr Met  
 115 120 125  
 Pro Met Thr Glu Lys Val Glu Glu Leu Leu Arg Val Ile Gly Pro Phe  
 130 135 140  
 Tyr Glu Ile Val Glu Asp Lys Lys Ser Gly Arg Ser Ser Asp Ile Thr  
 145 150 155 160  
 Ser Val Arg Leu Glu Lys Ile Ser Lys Cys Leu Glu Asp Leu Gly Asn

| 165 |     |     |     |     |     |     |     |     |     | 170 |     |     |     |     | 175 |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Val | Leu | Thr | Ser | Thr | Pro | Asn | Ala | Lys | Thr | Val | Asn | Gly | Lys | Ala | Glu |  |  |  |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |  |  |  |
| Ser | Ser | Asp | Ser | Gly | Ala | Glu | Ser | Glu | Glu | Glu | Glu | Ala | Gln | Glu | Glu |  |  |  |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |  |  |  |
| Val | Lys | Gly | Ala | Glu | Gln | Ser | Asp | Asn | Asp | Lys | Lys | Met | Met | Lys | Lys |  |  |  |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |  |  |  |
| Ser | Ala | Asp | His | Lys | Asn | Leu | Glu | Val | Ile | Val | Thr | Asn | Gly | Tyr | Asp |  |  |  |  |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |     |  |  |  |  |
| Lys | Asp | Gly | Phe | Val | Gln | Asp | Ile | Gln | Asn | Asp | Ile | His | Ala | Ser | Ser |  |  |  |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |  |  |  |  |
| Ser | Leu | Asn | Gly | Arg | Ser | Thr | Glu | Glu | Val | Lys | Pro | Ile | Asp | Glu | Asn |  |  |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |  |  |  |  |
| Leu | Gly | Gln | Thr | Gly | Lys | Ser | Ala | Val | Cys | Ile | His | Gln | Asp | Ile | Asn |  |  |  |  |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |  |  |  |
| Asp | Asp | His | Val | Glu | Asp | Val | Thr | Gly | Ile | Gln | His | Leu | Thr | Ser | Asp |  |  |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |  |  |
| Ser | Asp | Ser | Glu | Val | Tyr | Cys | Asp | Ser | Met | Glu | Gln | Phe | Gly | Gln | Glu |  |  |  |  |
| 305 |     |     |     |     | 310 |     |     |     |     |     | 315 |     |     |     | 320 |  |  |  |  |
| Glu | Ser | Leu | Asp | Ser | Phe | Thr | Ser | Asn | Asn | Gly | Pro | Phe | Gln | Tyr | Tyr |  |  |  |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |  |  |  |
| Leu | Gly | Gly | His | Ser | Ser | Gln | Pro | Met | Glu | Asn | Ser | Gly | Phe | Arg | Glu |  |  |  |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     |     | 350 |     |  |  |  |  |
| Asp | Ile | Gln | Val | Pro | Pro | Gly | Asn | Gly | Asn | Ile | Gly | Asn | Met | Gln | Val |  |  |  |  |
|     | 355 |     |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |  |  |  |
| Val | Ala | Val | Glu | Gly | Lys | Gly | Glu | Val | Lys | His | Gly | Gly | Glu | Asp | Gly |  |  |  |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |  |  |  |
| Arg | Asn | Asn | Ser | Gly | Ala | Pro | His | Arg | Glu | Lys | Arg | Gly | Gly | Glu | Thr |  |  |  |  |
| 385 |     |     |     |     | 390 |     |     |     |     |     | 395 |     |     |     | 400 |  |  |  |  |
| Asp | Glu | Phe | Ser | Asn | Val | Arg | Arg | Gly | Arg | Gly | His | Arg | Met | Gln | His |  |  |  |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |  |  |  |
| Leu | Ser | Glu | Gly | Thr | Lys | Gly | Arg | Gln | Val | Gly | Ser | Gly | Gly | Asp | Gly |  |  |  |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     |     | 430 |     |  |  |  |  |
| Glu | Arg | Trp | Gly | Ser | Asp | Arg | Gly | Ser | Arg | Gly | Ser | Leu | Asn | Glu | Gln |  |  |  |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |  |  |  |
| Ile | Ala | Leu | Val | Leu | Met | Arg | Leu | Gln | Glu | Asp | Met | Gln | Asn | Val | Leu |  |  |  |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |  |  |  |
| Gln | Arg | Leu | Gln | Lys | Leu | Glu | Thr | Leu | Thr | Ala | Leu | Gln | Ala | Lys | Ser |  |  |  |  |

465                      470                      475                      480  
 Ser Thr Ser Thr Leu Gln Thr Ala Pro Gln Pro Thr Ser Gln Arg Pro  
                                  485                                   490                                   495  
 Ser Trp Trp Pro Phe Glu Met Ser Pro Gly Val Leu Thr Phe Ala Ile  
                                  500                                   505                                   510  
 Ile Trp Pro Phe Ile Ala Gln Trp Leu Val Tyr Leu Tyr Tyr Gln Arg  
                                  515                                   520                                   525  
 Arg Arg Arg Lys Leu Asn  
                                  530

<210> 25  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:chemically  
                                  synthesized

<400> 25  
 agatctgacg aggatgagaa cagcccg                      27

<210> 26  
 <211> 42  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:chemically  
                                  synthesized

<400> 26  
 ctcgtcgtcg acgcaggcag ctatctccgc ctggtttttg tg                      42

<210> 27  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:chemically  
                                  synthesized

<400> 27  
 ctcgtcctcg agggtaagcc tatccctaac                      30

<210> 28  
 <211> 31  
 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically synthesized

<400> 28

ctcgtcgggc ccctgatcag cggttttaa c

31

<210> 29

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically synthesized

<400> 29

ggatccacca tggcgcaac gcggtggcag cctcac

36

<210> 30

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically synthesized

<400> 30

ctcgagacag ccgctccgtc ggccaggcca tgt

33

<210> 31

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically synthesized

<400> 31

gacgtcggat ccctagacct gattgctac gtgccgcag

39

<210> 32

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically synthesized

<400> 32  
ctcgtcctcg agacagccgc tccgtcggcc aggccatgtg 40

<210> 33  
<211> 40  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 33  
ctcgtcagat ctatgaagaa ccaggtatgc agtaagtgtg 40

<210> 34  
<211> 42  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 34  
ctcgtcctcg agggctccag tcatagatgt tgggtggtta aa 42

<210> 35  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 35  
caggtggaaa cggttcagaa a 21

<210> 36  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 36  
catctctctc cttcccaagg aa 22

<210> 37  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 37  
ctgtccattt tccaagagcc tcgagttttg t 31

<210> 38  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 38  
caggcacact gaccattcga 20

<210> 39  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 39  
gagcagggct tcagcactg 19

<210> 40  
<211> 24  
<212> DNA  
<213> Artificial Sequence

01  
<220>  
<223> Description of Artificial Sequence:chemically  
synthesized

<400> 40  
tgccttggt gtcacaagca caca 24

<210> 41  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 41

cagaggaagg atccagtgag tgt

23

<210> 42

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 42

catggagtat ggatctggaa atagtc

26

<210> 43

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 43

cagagcgccc tccctgtacc acaaa

25

<210> 44

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 44

gggagtgggc ctgactttct

20

<210> 45

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 45



gcatgtgatg acctcggaca

20

<210> 46

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 46

ttcaggcatc tgcaacctcc gtgg

24

<210> 47

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 47

aggacatagg atgcaacact tgag

24

<210> 48

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 48

ccagcgctcc ccatcac

17

<210> 49

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chemically  
synthesized

<400> 49

acctgccggc ccttggttcc t

21

*Q1  
Concise*